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NOTES ON THE NESTING HABITS AND SONGS OF THE MOCKINGBIRD*

BY J. PAUL VISSCHER

Although the Mockingbird is but rarely seen as far north as Cleveland, it is nevertheless a common resident of large areas of North America, ranging from Mexico northward to the zone in which we are, which is perhaps, its most northern limit.

It is an exclusively American bird and is closely related to the Catbird and Brown Thrasher and more distantly to the wrens, all of which are noted for their singing ability. But of them all it is generally agreed that the Mockingbird stands supreme in some respects, at least, as America's most remarkable song bird, and it seems doubtful to such men as Chapman and Shufeldt if even the Nightingale of Europe can equal the remarkable vocal powers which have made the Mockingbird famous throughout the world.

Although the scientific name, *Mimus polyglottos*, and the common name, Mockingbird, clearly indicate the habit of mimicking the notes of other birds, yet there are but few actual records of the notes and songs which it imitates.[1]

On Pivet's Island in the harbor of Beaufort, North Carolina, there are each year some ten or a dozen pairs of these birds nesting in the luxuriant growths of Yucca which adorn the grounds of the U. S. Biological Station located there. Here during the months of June and July for three successive summers, and on other occasional visits of a few days at a time, the writer has had the opportunity to study the nesting habits and songs of these most interesting birds.

The birds appear to be permanent residents of this locality; at least Mockingbirds are to be found there at all seasons of the year. They are more numerous, however, during the spring and summer months.

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*Presented at the joint meeting of the Wilson Ornithological Club and the Inland Bird Banding Association at Cleveland, Ohio, on November 26, 1927.

[1]Whittle, C. L. "The Arboretum Mockingbird." *Auk*, vol. 39, 1922, pp. 496-506.

Nesting begins in late March or early April, and a second brood is often well advanced by the middle of June. A third brood appears to be common but not universal.

Of the ten nests observed during one season, nine were placed in forks or in the dense foliage of the large Yuccas which grow to a height of more than twelve feet, with their sword-like leaves bristling for several feet in all directions. These growths afford admirable protection against most enemies, and even man frequently has difficulty in observing these nests.

The nests are made and completed during the course of about three days' endeavor on the part of both birds. The nests were begun by forming a loose structure of twigs as a sort of platform, on and in which a fairly substantial nest was made of sea weeds and grasses, mostly the common eel-grass which is found abundantly in windrows along the beaches of the island. This was lined by finer grasses, by pieces of cloth and even feathers.

The eggs are relatively large, about an inch in length and are heavily blotched with rufous brown on a pale bluish-green background. There were four eggs in each completed nest examined by the writer; but Chapman states that five and six are occasionally laid.

Incubation begins with the laying of the first egg, so that the young are not all hatched simultaneously. This difference is clearly noted throughout the brooding period when the nestlings are of noticeably diverse sizes, and this often results in the death of one or more of the brood. Although the nests are well built and advantageously located with reference to their enemies, they are frequently destroyed by the elements, often being exposed to the powerful rays of the sun and to the rather frequent torrential rains which often cause great havoc to the nests and nestlings. Several nests were found completely in ruins after such storms, and others were found in which the young were apparently drowned within the nest. Since heavy showers and storms of this sort occur with increasing frequency and strength during the course of the summer months it is evident that such disasters would occur more frequently with the second and third broods than with the first.

Piver's Island contains several acres of land but little more than one is exposed at flood tide. On this higher portion some thirty Yuccas are found. These are apparently allotted rather definitely between the Mockingbirds of the Island, as no two nests were found within twenty-five feet of each other, and during the nesting period each male appeared to guard his territory very effectively against encroachment, not to mention enpoachment.

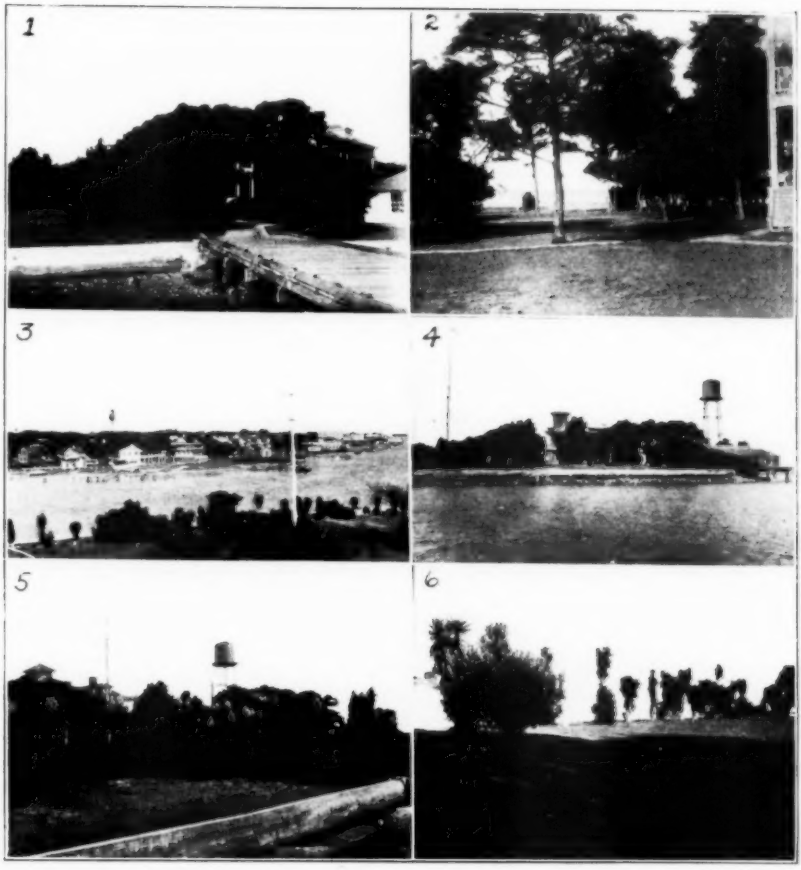

FIGURE 1. 1, Approach to the Laboratory Building of the U. S. Biological Station at Beaufort, N. C., with a portion of the pier in the foreground. 2, Scene on the island looking toward the "Banks," or sand dunes, which lie to the southward. 3, Waterfront of the town of Beaufort as seen from the island. 4, Piver's Island, with the U. S. Biological Station as seen from the mainland. 5, The waterfront of Piver's Island, showing the row of beautiful yuccas. 6, A view of some of the yuccas on Piver's Island: a Mockingbird is sitting on its favorite song perch in the top of the nearest yucca tree, but is invisible in the reduced photograph.

It is indeed an interesting and remarkable spectacle to observe two cocks in combat. Although these occur with some frequency during the course of a season, one pair in particular seemed always in trouble, and the fighting occurred in a very restricted area (less than ten yards in diameter) apparently midway between their nests. These two were observed on several occasions to utter peculiar notes and then to alight on the open ground some ten feet apart and to run toward each other with great speed, while constantly uttering harsh and rasping calls. Upon approaching each other they would literally jump perpendicularly into the air and attempt to peck the opponent on the top of the head. To observe such birds rising time and again by powerful jumps to heights of three to four feet, meanwhile calling loudly—perhaps vilifying each other or calling to their mates to watch—was indeed a novel spectacle. These fights frequently persisted for fully five or more minutes, but on no occasion was there a fatality.

It is also at the mating season that these birds display their remarkable vocal achievements. Each male apparently has a favorite nest perch from which he can guard his territory and from which he pours forth his songs in marvelous variety. Not all of the birds are equally expert as musical artists but the powers of one bird in particular attracted attention. The favorite perch for this bird was high up on the edge of the platform of the water-tower on the island. This bird would frequently sing from this perch for more than thirty minutes with little or no intermission. Not only did this bird sing in the daytime but on clear moonlight nights would pour forth his songs at most all hours—apparently determined by the fullness of the moon on that particular night. It was heard in early evening, late evening, at midnight, and during the very early morning hours as well as during the regular morning hours when many Mockingbirds would seem to join in chorus.

Taking advantage of this opportunity the author made, with the aid of a colleague at the laboratory, Dr. Hoyt Hopkins (formerly of Oberlin College), a list of the more characteristic songs and calls which were heard, uttered in most cases by the single male referred to above.

Robin (very often)
Bluebird (frequently)
Tufted Titmouse (very often)
Crested Flycatcher (occasionally)
Towhee (occasionally)
Killdeer (occasionally)
Cat-bird (frequently)
Brown Thrasher (frequently)

Maryland Yellowthroat (frequently)
Yellow Legs (rarely)
Oriole (Baltimore) (frequently)
Rail (Clapper) (rarely)
House Wren (occasionally)
Carolina Wren (frequently)
Yellow-breasted Chat (frequently)
*Grackle (Boat-tailed?) (rarely)
*Nuthatch (occasionally)
Cardinal (very often)
Oven-bird (very often)
Chickadee (frequently)
Quail (rarely)
Pewee (occasionally)
Scarlet Tanager (frequently)
Phoebe (occasionally)
Whip-poor-will (rarely)
Goldfinch (rarely)
*Green Heron (once)
Cedar Waxwing (once)
*English Sparrow (occasionally)
Song Sparrow (frequently)
*Purple Martin (once)
Kingbird (rarely)
*Night Hawk (rarely)
Flicker (frequently)
Crow (rarely)

Although this list comprises thirty-five birds it was apparent to both Dr. Hopkins and myself that many more were mimicked whose songs we were unable to identify at the time.

Mr. Charles W. Townsend in his article on Mimicry of Voice in Birds[2] states that the Mockingbird is the most proficient mimic among our native birds and notes that a single mocker at the Arnold Arboretum has been heard to mimic fifty-five different birds. He says in reference to this bird, which was also studied with care by H. W. Wright[3], and C. L. Whittle[4] as well, "the alarm and call notes of the Robin were as perfect as was the cheerful, glorious song of the familiar bird. The multiple calls of the Flicker were evidently favorites of his and were introduced at frequent intervals. The melody of the Song Sparrow was as unmistakeable but not perfect. The rattling of the Crow and of the Kingfisher, the whistle of the Bobwhite, the call of the

*Common on island.

[2]Townsend, Charles W. "Mimicry of Voice in Birds." *Auk*, vol. 41, 1924, pp. 541-542.

[3]Wright, Horace W. "The Mockingbird in the Boston Region, and in New England and Canada." *Auk*, vol. 38, 1922, pp. 382-432.

[4]Whittle, C. L. "The Arboretum Mockingbird." *Auk*, vol. 39, 1922, pp. 496-506.

Barn Swallow and the songs of the Baltimore Oriole, the Bluebird, the Scarlet Tanager and the Chewink, all in turn delighted my ears." He then asks, "could any one doubt that his imitations were conscious ones and that he took pleasure in them?" Townsend also relates an instance reported by Dr. S. C. Brooks of an apparent example of conscious mimicry in the Mockingbird. The bird was imitating the calls of the Killdeer, when a Sparrow Hawk flew by, and the mimic at once set up the rolling call of this hawk apparently throwing the hawk completely off his guard.

The author has wondered if this is a proven case of mimicry or if, as in so many birds, it is only an example of the ability to sing more than a single tune. Of the thirty-five birds listed above, those birds which were co-residents on the island were mimicked with much less frequency than others which were never seen by the author during his sojourns there, although it must be admitted that in almost every case they are listed by Pearson in his "Birds of North Carolina" as migrants through this territory. It is also significant that the songs most frequently mimicked by these birds at Beaufort, N. C., are the same ones which are the favorites of Mockingbirds from widely separated territories as at Cambridge, Massachusetts, at St. Louis, Missouri, and even of those in California.

Townsend admits that the close relatives of the Mockingbirds, the thrashers and the wrens, have many inventive songs, although most of them have series of couplets which are characteristic of the songs of other birds. He would agree that all real songsters mimic to a certain extent, but that the better ones are inventive as well; that is, they have the ability to add short musical phrases to the songs inherited or heard, and that thus new songs are produced. As typical examples of this he would list the Brown Thrasher and the Hermit Thrush while he believes that the English Starling and the Mockingbird are only mimics.

Opposed to the idea of Townsend, however, are the observations of Mr. Donald R. Dickey[5] in which he cites examples of mimicry in a Western Mockingbird in a bird which had just completed its juvenile molt. He believes that "the very few months which had actually elapsed since his youngster first saw light would seem to form all too short a period for the purely imitative acquisition of so varied a repertoire," and suggests that the basic phrases of the Mockingbird's vocabulary which simulate the notes of other birds may be an intrinsic part of his inherited vocal ability.

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[5]Dickey, Donald R. "The Mimetic Aspect of the Mocker's Song." *Condor*, 1922, vol. XXIV, pp. 153-157.

Saunders[6] in his study on the "Recognition of Individual Birds by Songs" would also give some support to the idea that not all of the remarkable vocal abilities of a Mockingbird are his by virtue of mimicking power alone.

On the basis of my own observations it seems probable that many of the tunes which a Mockingbird sings are inherited in much the same

FIGURE 2. 7, A typical yucca in full bloom, in which Mockingbirds nested for three successive seasons. 8, A cluster of yuccas, showing the favorite nesting place of the Mockingbirds.

manner as instincts. We are aware on the basis of recent studies of inheritance, and of neurology as well, that there are many complex cortical patterns, which when stimulated produce a definite and complete series of reactions. It seems very probable that in the Mockingbird there are many such complex patterns which are definitely inherited and only need an appropriate stimulus to provide expression.

Since the songs sung by the Mockingbird under observation were not those most commonly heard, since they agree in the main with the songs which are the favorites of other Mockingbirds in widely scattered areas, and since there is such great variability in the vocal powers of different individuals, it seems probable that a Mockingbird does not as

[6]Saunders, Aretas A. "Recognizing Individual Birds by Song." *Auk*, vol. 41, 1924, pp. 242-259.

a rule consciously mimic songs, but only possesses an unusually large series of melodies which it calls forth in wonderful perfection and in most surprisingly clear and melodious tones. To me the thrill of listening to a fluent Mockingbird is much like listening to a symphony where the themes are those which we often associate with other less able or artistic birds.

The author in no wise wishes to belittle the wonderful artistry of this remarkable bird. He has enjoyed to the fullest the marvelous songs, has been thrilled to the depths by its music, and has often been surprised at the dexterity of this avian artist, but he only questions if these are "conscious" and even "purposive" endeavors, as has been claimed by many writers.

And so he would suggest that perhaps the Mockingbird is no more of a mimic than the Robin, the Cardinal, or the wren, each of which mimics more or less successfully the songs of its parents. The Mockingbird, however, is outstanding in its remarkable repertoire but is only slightly if at all more remarkable than the Hermit Thrush, or the Brown Thrasher, and others of its close relatives, with which we rarely if ever associate mimicry. Accordingly, it seems probable that all of these birds inherit various neural patterns, which appropriate stimuli activate, thus reproducing the songs characteristic of each species.

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Cleveland, Ohio.

ON THE STATUS OF HARLAN'S HAWK

BY G. EIFRIG

Last June I spent ten days in Northwestern Wisconsin, near Hayward, at the home of Mr. K. W. Kahmann, the Chicago taxidermist.

Here I observed the Clay-colored Sparrow in life, as a breeding bird, for the first time in my life, and noticed the Sharp-tailed Grouse and Brewer's Blackbird to be common residents, showing that here there is a strong infusion of western avifauna. I was equally interested, however, in a collection of mounted raptores which Mr. Kahmann had in his shop. Among them was a large black hawk. It was not the roughleg, as one look at the tarsi showed; nor a Swainson's Hawk, because it had the four, instead of the three, outer primaries notched. It turned out to be a typical Harlan's Hawk (*Buteo borealis harlani*).

After reaching home with the specimen in my possession, I consulted all available literature on the status of this hawk, which has

always been looked upon as being rather uncertain. Baird, Brewer, and Ridgway have a long detailed description, also Ridgway in his "Birds of Illinois"; Bendire has notes on the behavior of this species, but no description. Mrs. Bailey, in her "Handbook of the Birds of the Western United States" does not mention it, but Chapman in his "Handbook" has it. Taverner, in his "Birds of Western Canada" expresses the opinion that Harlan's Hawk is only a color phase of the Western Redtail (*Buteo borealis calurus*), and his opinion carries considerable weight because he probably gets more material of these species than most collectors or museums.

However, the question as to the status of Harlan's Hawk has recently acquired a new phase by the findings of Swarth and Brooks in the Atlin region in Northern British Columbia. This is published in their "Report on a Collection of Birds and Mammals from the Atlin Region, Northern British Columbia", 1926. To their surprise and the readers' surprise, they found Harlan's Hawk to be the only species of *Buteo* breeding there. Thus, for the first time a definite breeding range has been found. All the previous records seem to be winter and migration records from the southern and central states, never a breeding record. This also holds good for the first of all records, that by Audubon, whose statement that the bird or birds he got had bred near St. Francisville, Louisiana, is evidently based on hearsay. Beyer, Allison and Kopman, in their "List of the Birds of Louisiana" (1908, p. 442) say that they have no evidence of this bird breeding or ever having bred in Louisiana. No wonder the status of Harlan's Hawk was rather hazy in character. But this uncertainty now seems to have been largely swept away by the finding of a definite breeding ground of this form.

Now the question arises, "Are the differences in coloring between Harlan's Hawk and the melanistic phase of the Western Redtail pronounced enough and constant enough to justify the belief that Harlan's Hawk is a distinct subspecies?" We think they are.

First, there is much more white in the plumage of Harlan's Hawk than in the Western Redtail. In fact, many of the feathers on the neck and breast have only a rather small arrowhead-like black mark, the larger part of the feathers being snowy white. This is not true to nearly the same extent in *calurus*.

Second, there is no brown on breast and belly in Harlan's Hawk as is true of *calurus*.

Third, there is an utter lack of barring on the tibial feathers in *harlani*, which seems to be diagnostic for *calurus* in any color phase.

Fourth, the tail of *harlani* is decidedly different from that of *calurus*. The latter in its tail always shows its relationship with the Western Redtail, by the larger amount of reddish brown on this member. The tail of Harlan's Hawk shows next to no brown, but only slight traces of it and gray marks *longitudinally* arranged. The tail is also more square than in *calurus*. A peculiar condition was brought out by Swarth and Brooks' investigations, inasmuch as they found one of their specimens, undoubtedly *harlani*, to have only three notched primaries instead of four. Therefore, the conclusion seems to me to be warranted that *Buteo borealis harlani* is entitled to subspecific, if not to specific, rank.

River Forest, Ill.

TRAILL'S FLYCATCHER IN SOUTHERN MICHIGAN

BY WM. G. FARGO

Until 1927 I had not discovered Traill's Flycatcher (*Empidonax trailli trailli**) breeding in Jackson County, Michigan, which is in the latitude of Detroit. For the past five years I have searched the woods and marshes of this county for nests in general and have always found fairly common: *E. virescens*, *E. minimus*, *Myiochanes virens*, and *Sayornis phoebe* as breeding birds, but until 1927 never *E. t. trailli*.

On June 1, 1927, along a sluggish spring brook, bordered with willow brush, *Cornus*, etc., winding through marshes in the northwest part of this county I saw two *Empidonaces* a quarter of mile apart that appeared to be *E. t. trailli*. On June 6 I saw one pair of these birds beginning a nest at the same place where one was first seen. This nest was about six feet up in an upright crotch of willow bushes on the creek bank. Going a quarter of a mile down stream I collected a male *Empidonax* that subsequently was identified by Dr. H. C. Oberholser as *Empidonax trailli trailli*.

On June 27, going to the above locality, I found that the nest I saw being started was not completed, but further down the creek I found a nest of *E. t. trailli*, with one of the adults hovering about. The nest was three feet, ten inches above the ground in an upright, multiple crotch of a one-inch elm sprout, and contained three young birds about two days old and two creamy white eggs with cinnamon brown spots in

*In the Ohio Journal of Science, Vol. XVIII, No. 3 (Jan., 1918), p. 85 and following, Dr. H. C. Oberholser points out that the type locality of *Empidonax trailli trailli* (Audubon) was within the range of the eastern form, hence *E. t. alnorum* (Brewster) becomes a synonym. The western form Dr. Oberholser proposes to call *E. t. brewsteri*. In the present paper the change of name thus proposed is used.—W. G. F.

a wreath about the large end, also a few spots elsewhere. One egg measured .49x.72 inches.

This nest, shown in photograph No. 1, appears to be a typical nest of the species for this locality. It was composed of dry grass stems with some cottony material around the top and a bit of fur and feather-down at the top of rim. It was lined with dry grasses and measured 3¼x3¼x3¼ inches outside and 2¼x2 inches inside, hori-

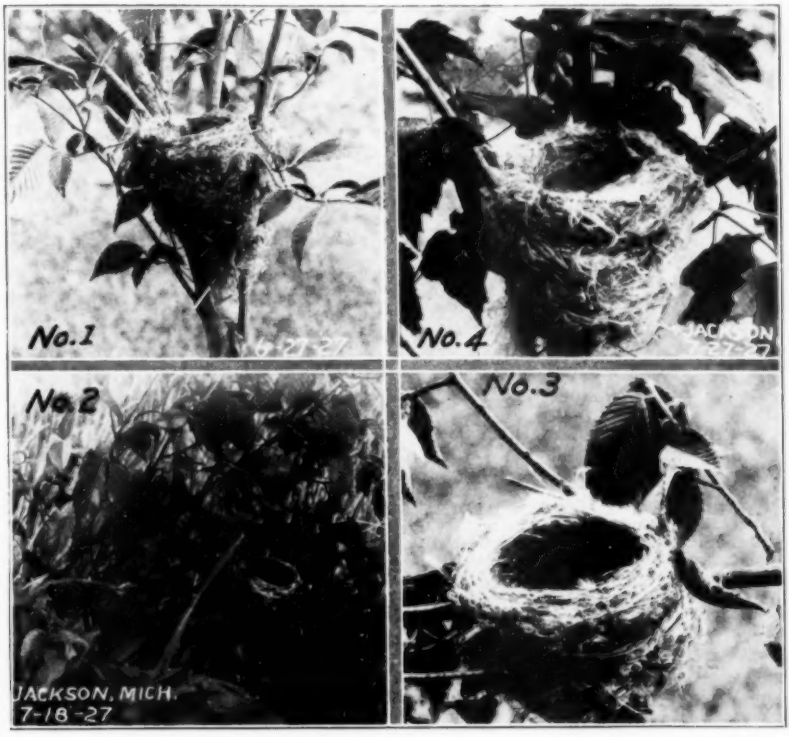

FIGURE 3. Nests of the Traill's Flycatcher, referred to in the text.

zontally. It was well hidden by the foliage of the elm and the five-foot high "blue-joint" grass in which it stood.

In the south part of the city of Jackson is located Ella W. Sharp Park containing 530 acres, where on June 30, near a ditch leading from a cat-tail marsh I found my second nest of Traill's Flycatcher. This nest was 3½ feet above ground in cornus bushes (*C. paniculata*). These bushes make a dense group in the interior of which the nest was hidden. It was on top of a nearly horizontal ascending branch about three-eighth inch in diameter and contained four typical eggs.

I was attracted to the locality by an adult *Empidonax* feeding in the vicinity. This nest was quite similar in appearance and materials to those of the Yellow Warbler and Goldfinch, but as stated it was on a nearly horizontal branch cradled by rising twigs. No grasses were visible, it being made of gray plant fibres.

The third nest I found on July 10, 1927, in a small scrubby elm on the banks of a sluggish grass-filled creek, twenty feet wide, some two miles southwest of the nest in the Park. The elm scrub was immediately on the creek bank and the nest in plain sight on a half inch descending limb three feet out over the water and less than two feet above the water surface. It contained one egg similar to the others described. One adult was hovering along the opposite bank of the creek.

Visiting this nest again eight days later I found a young bird that must have left the egg a week before, and as before one parent was hovering about. This nest is shown in photographs Nos. 2 and 3.

On July 22, 1927, three miles east of the Park along a bush bordered stream in a broad open marsh I found an *Empidonax* having the brownish back of *E. t. trailli* hanging about a certain spot and soon located an empty nest eight feet up in a bushy red maple some thirty feet from the creek bank. This nest in an upright crotch, was of the size and form of the nest first described, but contained less grass and more plant fibres. This nest was visited again on July 27 and the bird was in the immediate vicinity as before, but the nest was empty and seemed too fresh and clean to have raised a brood. It was too large for the nests of either Goldfinch or Yellow Warbler, neither of which nor other birds likely to have built the nest were seen here. This nest is shown in photograph No. 4.

During June and July, 1927, I found *Empidonaces*, usually in pairs located in definite "territories" in a total of seven different localities in Jackson County. Two specimens submitted to Dr. Oberholser were identified as *E. t. trailli*. In nearly every instance it was possible to observe the birds in such light and close distance as to be reasonably certain that the color of the back was not the *greenish* brown of *E. virescens*.

In this region the habitat of *E. virescens* is quite different from that described above for *E. t. trailli*, the former nesting in the forest and invariably building a thin-walled basket-like *pensile* nest. It is true that *virescens* sometimes builds near a stream bank but those nests I have found were never out in open marshes but on the contrary on higher ground whether near a stream or not.

It is well known that *E. t. trailli* breeds abundantly in Ohio and there are several old records of its breeding in Michigan, particularly in the southeast corner of the state and in the southern two tiers of counties. (See Barrows' "Michigan Bird Life," page 404).

After the young left the nests it was noted that but one adult was seen about the nest area in any of the Jackson County localities. Two Traill's Flycatchers thus collected proved to be adult males. This would point to the fact that the female and young leave the nest locality as soon as the latter are able to travel, while the male parent lives in his "territory" until the end of July or later, and he is almost certain to be found in a rather re tricted area, say of two hundred feet along a stream.

JACKSON, MICHIGAN.

A THEORY OF HOW THE TURKEY VULTURE FINDS ITS FOOD

BY WILLIAM BREWSTER TABER, JR.

Having read Mr. Lewis' "How Does the Turkey Vulture Find Its Food" in the WILSON BULLETIN (Sept., 1928, also published in the Oct. 1928, *Auk* under the title "Sight and Scent in the Turkey Vulture"), and Mr. Leighton's article on the same subject in the *Auk* (July, 1928), it seems pertinent to contribute the results of an experiment which I made to test the food finding faculties of Turkey Vultures, and to advance what I believe is a new theory of just why it is easier for a Turkey Vulture to find its food by *sight* when the food is rotten and of a particulary offensive and foul odor than when it is fre h.

First, let me describe an experiment which convinced me that vultures do not find their food by scent and that sight is their only means of discovery, and then I shall give some observations which led to the before mentioned theory.

In the late winter of 1926, while trapping Crows, I caught a Turkey Vulture. Thinking that it would serve as a call bird for Crows, I kept it for several weeks and during that time repeated Darwin's experiment with Condors (Voyage of the Beagle), which led him to believe that vultures find their food by sight alone. During this period the vulture was kept at night, and likewise during the days when I did not use it as a call bird, in an old empty chicken house. It inhabited these quarters for more than two weeks before the experiment was made, and had been fed there many times, so that the effect of these artificial conditions was reduced to a minimum. The first procedure was to whet the bird's appetite. This was done by supplying it with no other food than water for a period of sixty hours. It showed no signs

of inconvenience or suffering during this time, and except possibly for a keener, more alert, attentive, and expectant attitude whenever I entered the building showed no visible signs of excessive hunger. Nevertheless after such a fast there could be no doubt that the bird was hungry.

I then cut from a hog carcass, which I had been using for bait for Crows, a piece of strong smelling meat and wrapping it in newspaper placed it on the ground before the vulture, which was perched on a low roost a foot or so above it. Believing that my presence might distract the bird I retired from the building, closed the door, and watched through a crack. I could distinctly smell the bait from where I stood fifteen feet away and outside the building. After what appeared to be a casual inspection from the roost, it preened its feathers and paid no further attention to the newspaper or its contents. Waiting for full twenty minutes, I then entered the building, opened the newspaper, left the meat on the paper, and took a seat inside the chicken house about ten feet away. As soon as the carrion was visible the vulture was all attention, waiting only until I had moved a few feet away before hopping down from its perch onto the newspaper and its long postponed repast. It was plain that neither the newspaper nor my presence deterred it from eating; and it also seemed certain from its lack of interest before the paper was opened that the bird simply did not know the food was there. This was in spite of the strong odors, so unpleasantly apparent to even the dull sensory organs of a human being. The experiment convinced me that scent is not a factor in finding food.

But then how shall we explain Mr. Lewis' experiences in the summers of 1927 and 1928 when vultures were attracted to covered baits, which were not visible, only after they had been dead long enough and under warm enough conditions to be somewhat decomposed and odoriferous? The first inclination is to conclude that it was the smell that attracted them. But it may have been by their sight they detected the presence of food even though they could not see the food itself, as I shall explain.

My explanation is based on the fact that the association of events has meaning to birds as well as the lower animals. This does not necessarily imply the ability to reason, although they may to a limited extent possibly have that ability, but merely that through long experience they have learned to recognize the significance of certain events, and consequently govern their acts accordingly. Anyone who has witnessed the rapid response of a group of tree sparrows, juncoes, woodpeckers and chickadees to the stimulus of the sight of a Sharp-shinned

Hawk skimming above the tree tops, realizes that this event has meaning to the group, and a meaning which causes immediate action. As I have pointed out in an article, "The Mentality of the Crow," published in the WILSON BULLETIN (March, 1927), a number of Crows feeding on the ground attract other Crows to their feast. Similarly vultures perceiving Crows in a compact group about an object realize that often this means food for them. It is by such signs that the vultures found Mr. Lewis' bait although they could not see it. In these particular instances, it was unquestionably not Crows that attracted the vultures. However there are other creatures which through smell detect the presence of carrion and are attracted to it. Carrion beetles and some small rodents feed upon decomposing meat and undoubtedly find their food by following up the scent. Although such small creatures could not be seen by a human being at any considerable distance, the carrion beetles, some of which are brightly colored, and the larger forms of mice and ground squirrels converging upon a rotting carcass might be easily distinguishable to the keen eyed vulture flying over-head in search for just such indications; and having perceived these signs the vulture through long experience knows that this means food.

I therefore wish to advance the theory that vultures find their food by observing the actions of carrion feeding creatures, as well as by discovering the food for themselves by direct vision.

KANSAS, ILLINOIS.

A SOUTHWARD MOVEMENT OF BREEDING SAVANNAH SPARROWS IN OHIO?

BY LOUIS W. CAMPBELL

It is a general fact accepted by ornithologists that the trend of breeding ranges of birds is always northward. Familiar examples in Ohio are the Carolina Chickadee and the Bewick's Wren. But occasionally one observes a species which apparently is either not obeying this rule or is returning to its original nesting ground. At present it is the Savannah Sparrow (*Passerculus sandwichensis savanna*), whose normal breeding range is given as southern Canada, which seems to be spreading southward through Ohio.

The history of this species in the state as a nesting bird is soon told. Dr. Wheaton in 1879 lists is as a probable breeder in the northern counties but states that it was not recorded by Dr. Kirtland or Mr. Read. In fact, his only positive record was that of Mr. H. C.

Benson at Gambier, Knox County, in the central part of the state. The next nesting accounts were those of the Rev. W. F. Henniger (Wilson Bulletin, XVII, p. 91), in Scioto County, and Mr. E. A. Doolittle (Wilson Bulletin, XXIX, p. 161), in Lake County. Both Dr. Lynds Jones and Mr. W. L. Dawson state in their publications that they have never found this species breeding, nor was it reported to Dr. Jones by his large number of correspondents, among whom, incidentally, were two observers from Lucas County. This makes a total of but three published records for the state of Ohio up to the year 1926. It is also interesting to note that in "Michigan Bird Life," by Professor Barrows (1912), there is no mention of its occurrence in the bordering counties of Michigan.

In the years 1926 to 1928, however, there was a very decided increase in the number of breeding Savannah Sparrows in Ohio. I am indebted to Mr. Charles Walker for the following records of the Wheaton Club of Columbus, Ohio. In 1926 this species was found "breeding commonly" at Camp Perry in Ottawa County by Mr. E. S. Thomas. In 1926, 1927, and 1928 a few pairs were found in Huron County by Mr. Walker, and in 1928 Mr. Trautman located one or two pairs in southern Delaware County. Besides these records of the Wheaton Club, there is a report in *Bird-Lore* of July-August, 1928, of a pair nesting at Youngstown, Trumbull County (Mr. Christy). From Lake County Mr. Doolittle sends word that his small colony of from one to three pairs still persists. These birds, therefore, do not enter into the picture.

My own observations of bird-life in Lucas County began in 1926. In 1927 I found four pairs of Savannah Sparrows rather widely separated. The year 1928 brought a very great increase, due to some extent, no doubt, to my greater familiarity with the song of the species. Counting each singing male in the nesting time a pair, I have the following records: Wood County, 1; Ottawa County, 4; and Lucas County, 41, which includes a single colony of about 20 pairs on the east shore of Maumee Bay. The remaining were mostly in small groups of two or three pairs. It must be borne in mind that I did not make any special search for these sparrows, merely listing them on the usual field trips. All of these recent records would certainly seem to indicate a southern movement throughout Ohio.

Any change which may have been made in the physical condition of the state through clearing or drainage would in all probability be unimportant when dealing with a bird as easily suited as the Savannah Sparrow. Its choice ranges from a "pasture of rather barren soil with many granite boulders scattered about" in Lake

County, to a cranberry bog in Huron County. I have found this species on the borders of wet prairies with Henslow's Sparrows, in hay fields and meadows with Grasshopper Sparrows, and in clover fields with the Dickcissel. The only requisite seems to be the presence of water nearby, whether it be a narrow drainage ditch or Lake Erie itself. In fact there is a tendency to group in large numbers along the lake. This is brought out by Mr. Thomas' observations at Camp Perry, which is on the lake, and my own on Maumee Bay.

It would, of course, be foolish to attempt to draw any conclusions from the records of three years but I am presenting these facts for the consideration of other observers. Perhaps this species has always been present through the state, but I cannot believe that such pioneer ornithologists as Dr. Kirtland and Dr. Wheaton, and, in later years, Dr. Lynds Jones and Mr. W. L. Dawson could have so consistently and unanimously overlooked a bird as comparatively easy to identify as the Savannah Sparrow.

Toledo, Ohio.

NESTING HABITS OF THE SEASIDE SPARROWS IN FLORIDA

BY DONALD J. NICHOLSON

The Seaside Sparrows are well represented among the extensive coastal marshes on the Forida Peninsula, which, taking all the curves and indentations, is about 3,000 miles of coast line. For miles along the Atlantic side, the Halifax and Indian Rivers parallel the ocean with a narrow strip of land between. In the river at places there are many islands and marshes with a network of creeks and sloughs running among them. Most of the marshes have heavy, extensive growths of *Salicornia*, or pickleweed, marsh grass, salt grass, and a sharp pointed grass or reed—a species of *Juncus*. In spots on Merritt's Island where the Dusky Seaside Sparrow breeds, and at Cape Sable where the Cape Sable Sparrow nests, there are large patches of bunch or switch-grass. Also among the Salicornia marshes small mangroves are found and are sometimes used for nest-sites by the Macgillivray's Sparrow. Among the bayous and mouths of the various rivers that flow into the Gulf, are favorite habitats of the Seasides of the West coast.

Florida has six breeding species and subspecies of Seaside Sparrows. The Macgillivray's and Dusky, both found breeding only on the Atlantic side; the Cape Sable Sparrow at the extreme southern end of the mainland at Cape Sable; and Scott's, Griscom's, and Howell's Seaside which range from Clear Water to Tarpon Springs north to the Alabama line.

Macgillivray's Seaside Sparrow

It is not supposed that the Macgillivray's breed south of Matanzas Inlet, but on June 22, 1925, I found quite a large colony breeding in the salt marshes on the Indian River, opposite New Smyrna, Volusia County, Florida, which is the southernmost record known. Scattered colonies are found from New Smyrna north almost to Daytona, according to A. H. Howell, of the U. S. Biological Survey.

According to Arthur T. Wayne (*Auk*, Vol. XLIV, April, 1927, page 254) Pea Island, North Carolina, is the most southern breeding record, and it breeds from that point to the southern breeding range of *P. m. maritimus* to the north. He also states that there is another race entirely different from the *macgillivraii*, which he discovered upon an examination of a series of skins, nests, and eggs taken at Cabbage Island, Warsaw Sound, near Savannah, Georgia, by Gilbert R. Rossignol, Jr., years ago. These Cabbage Island specimens are identical. in color and size, with the Seasides which were referred to as *macgillivraii* by Alexander Sprunt, Jr., in his paper (*Auk*, Vol. XLIII. October, 1926, pages 549-550) according to Mr. Wayne's findings.

Specimens of a number of the Seaside Sparrows which breed at New Smyrna, Florida, were secured by A. H. Howell, and pronounced in Washington as true *macgillivraii*. It seems strange that the breeding colonies of Matanzas Inlet and New Smyrna, which are pronounced Macgillivray's should be nesting so far from others of this form; a jump from Pea Island, North Carolina, to Matanzas, Florida! Might it be possible that the members of the Biological Survey in Washington were mistaken? Mr. Wayne is now working on this puzzling distribution and I hope that he will soon publish his solution.

It was not known that the Macgillivray bred farther south than Matanzas Inlet region, and no Seasides were known to breed any farther south than Merritt's Island, the home of the Dusky, which is found in considerable numbers in suitable localities along the river's edge on the Island. I discovered a species of Seaside Sparrows nesting in the vast salt marshes on the Indian River opposite New Smyrna, on June 25, 1922. At the time, and for two years afterwards, I felt sure that I had found the Dusky; still there was a doubt in my mind, and this was settled by my friend, A. H. Howell, who secured specimens which he sent to Washington for identification, and which were found to be Macgillivray's.

The strange part about the colony is its *isolation* from others of this species. The bird is only found embracing a range of possibly ten miles in length, and none are again found until you reach Matanzas Inlet, a distance of about forty miles; with much of this inter-

vening region apparently much the same, one would naturally expect to find them. It would not be easy to overlook them if they were here, as they pour forth their jerky little songs quite regularly, frequently rising in the air while singing, to a height of thirty feet above the marshes.

The nest found on June 25, 1922, contained four eggs well incubated. It was built in the lower limbs of a small mangrove bush growing among tall marsh grass, and situated a few yards from the river. The nest was placed in the fork of a branch, with the bottom hanging in mid-air, and composed of dead marsh grass lined with

FIGURE 4. Nest and eggs of Macgillivray's Seaside Sparrow, Halifax River, near New Smyrna, Volusia County, Florida.

finer grass and deeply cupped. Where the bush stood the tide covered the marsh for a depth of several inches. The bird was not seen to flush, but was seen scolding with its mate a few yards away. No other occupied nests were discovered, but two other old nests were found in dense *Salicornia* a few inches from the ground.

At this point the river is very wide, perhaps three-quarters of a mile. There are many islands, coursed with shallow sloughs and mud flats exposed at low tide. Some are covered with dense growths of *Salicornia* mixed with marsh grass and fringed with mangrove trees and here and there among the open spots are small mangroves several feet high surrounded by the undergrowth. In these open spaces the Macgillivray's nested in colonized form, and were quite numerous. The birds would rise every few feet, and drop into the grass again.

Some took quite long flights of two hundred yards before alighting. Even when watched from concealment these long flights took place.

One morning just after sunrise I arrived on the scene and they were in full song all about me. Some perched unseen in the tops of the *Salicornia* or grass, and often in a mangrove bush. Occasionally, a bubbling male would rise on fluttering wings, singing as he flew upward and, in his descent, alight in the grass and resume the song. I have watched a male change his singing station a number of times within half an hour, flying from twenty to over one hundred feet, and continue his buzzing song. Many males sing at the same time, and this continues all day, until after sundown, but there are periods during the heat of the day when all are silent. These lapses are short, and in about forty-five minutes some smitten male will burst out in song and the others will follow.

It was not until April 20, 1925, that I visited this colony again, and fortunately I struck them at the beginning of the season, and full sets were in order. I took five complete sets of three eggs each, and the following day took another set of three eggs, and found an incomplete set of two eggs. Six of these were built in marsh grass or *Salicornia* from ten to twenty-four inches from the ground. The other nest was built 2½ feet up in a young mangrove. All nests were extremely well concealed, and it was necessary to part the grass in most cases to find them. I watched the bird from a distance fly to the mangrove nest and flushed her at a few feet. But in most cases it is pure perseverance that rewards one. Seldom a bird is flushed off the nest. They never drop to the ground and run, but always fly directly from the nest. All seven nests were built of the same material—dead marsh grass, lined with finer grass, neatly cupped, but varied in size considerably. Later in June I discovered another nest with four naked young, in a small mangrove bush, making three found in bushes.

On April 25, 1926, in company with William Leon Dawson, I visited the same colony and found them a trifle earlier. One nest contained a single fresh egg, another three young in pin feathers, and two other nests containing three incubated eggs each. All four were in the *Salicornia* or grass. Out of a total of thirteen nests examined up to this time only three nests held four eggs or young; but in the season of 1927, four nests with four eggs or young were found, also two nests with three eggs and a complete set of two eggs badly incubated.

Numbers of times I have found one or two eggs, or a nest ready for eggs, and left for complete sets, only to return to find them in-

variably destroyed; and the only logical conclusion is that the sparrows destroy the nests themselves, as it could not just happen in so many instances. In no case did I ever find a Macgillivray nest resting on the ground, and in the greatest majority of cases the nests were open-topped and not arched; but some of the nests found in marsh grass had a canopy or arch built of green or dead grass, or both, bent over and woven in sides of nest. In numerous nests discovered never more than four eggs or young have been noted, with three eggs in majority. Only four nests have been found in small mangroves, and all others in grass or *Salicornia*.

Dusky Seaside Sparrow

I had never seen a Dusky until May 2, 1926, when I was on a trip accompanied by Mr. Dawson on Merritt's Island, about fourteen miles North of Cocoa, Brevard County, Florida. The nature of the country is somewhat different from that around New Smyrna. The territory where a nice colony was found bordered the Indian River, and was covered with dense patches of *Salicornia* close to the water extending back many yards and beyond this in the drier parts, were patches of switch grass, a rush-like species of *Juncas;* and here and there in spots the thick luxuriant salt-grass grew. The sparrows nested as readily in the dry places as the moist ground, and if anything, preferred to nest on dry ground. This sort of country stretched for miles, as far as the eye could reach along the river, and through this ran sloughs, creeks, and bayous.

Soon as we reached this place we saw several of the birds flying about, and their songs appeared to us a little different from those of the Macgillivray's, and the two songs would have to be heard together to notice any appreciable difference. The best description of the song that I can give is the following: It is preceded by two metallic notes in the same pitch resembling *Dick, Dick*, and followed by a buzzing which is hard to describe. Different males have different songs, and some have four or five different songs. Another phase of the song is a series of bubbling, zig-zag notes similar in character to the song of the marsh wrens. So similar are the songs of the Macgillivray and Dusky Seasides, that we could not tell which bird it was until we had observed the Dusky at close range, and found them decidedly darker than the birds of the New Symrna district.

Dawson was the first to discover a nest with four young in the pinfeather stage, by seeing the parent fly directly to the nest. It was built in a lone bunch of switch-grass, ten inches above the ground, and extremely well concealed. The parents did not scold as we ex-

amined the nest. This was the first nest of this rare species that I had ever seen. Not to be outdone by a brother ornithologist, in a strange country, I soon located a second nest with four young about the same age, and in a similar situation.

The birds did not come near and were not seen. These two nests were the only ones found and we felt well rewarded in our first attempt. I did, however, find a young bird just out of the nest, by watching the parent patiently. The parent held in her bill a large green worm fully an inch long, and fed it to the young, after holding it about ten minutes scolding, and too cautious to reveal her mission. I caught the young after a lively chase, and after securing several excellent pictures, set it free.

It was quite evident that the first nesting was about over, as no new nests were seen. It is apparent that the Dusky and the Macgillivray begin nesting about the same time, and fresh eggs may be expected by April 20.

I figured that the birds would rear another brood in about six weeks and from the following account will be seen how well my surmise was calculated.

On June 20, 1926, I again visited this interesting colony, and found the marshes fairly sizzling with their peculiar songs. Birds were heard in every direction, from the grass-clumps, *Salicornia*, rushes, and salt-grass and very infrequently, a male would rise in full song to a height of twenty to forty feet, dropping back to the grass on quivering wings.

After an all-day search in the scorching hot sun, looking in every possible place for nests, I succeeded in finding two sets of four eggs and a nest with three eggs. The first one was found by raking the short dead salt-grass with the toe of my shoe, and came near upsetting the first nest with eggs that I had ever found. The bottom of the nest did not quite touch the ground, but very close to it.

The next nest was built in the dead top of living *Salicornia* twelve inches above the ground, and the bird flushed at eight feet alighting in the grass ten feet away. She soon flew some distance away. The third nest was well concealed in a slim bunch of switch-grass (only about ten inches wide) out in the open. It contained three fresh eggs. The male scolded fifty feet away.

Desiring a nice series of the eggs of this little known species I again returned on June 27, 1926, and was well rewarded. Upon this

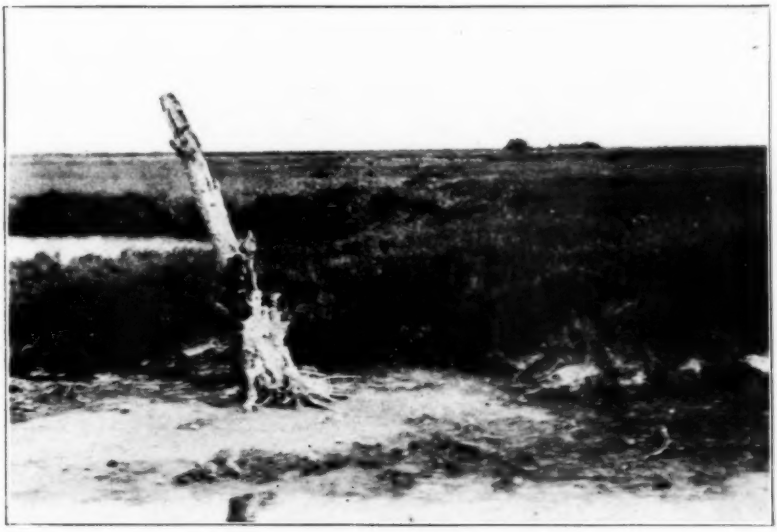

FIGURE 5. Typical nesting grounds of the Dusky Seaside Sparrow bordering the Indian River on Merritt's Island, Brevard County, Florida.

FIGURE 6. Nest and four eggs in Salicornia of Dusky Seaside Sparrow on Merritt's Island, Brevard County, Florida.

date the second broods were in bull blast, and I was fortunate enough to locate fourteen nests, summarized as follows:

One nest with two eggs.
One nest with one egg.
Two nests ready for eggs.
One nest with three small young and one egg.
One nest with one young and two eggs.
Six nests with four eggs each.
Two nests with three eggs each.

None of these were found upon the ground, and the average height above the ground was twelve or fourteen inches, except one nest found on June 20, which was within two inches of the ground. I am of the opinion that the birds of this particular colony *do not* build upon the ground. These fourteen nests were built in either dense growth of *Salicornia*, in isolated bunches of switch-grass, or in patches of *Juncus*.

In the switch-grass were found the cleverest and most artful nests which were marvels from a standpoint of concealment. The nests were constructed of the same grass, and attached to the stems. When standing within a few feet or even directly over the nest, some of these nests could not be detected. A neat little trick, practiced in a number of instances, was the habit of scattering a few wisps of grass *carelessly* but directly, over the nest proper, thus shielding it from view from above and giving it the decided effect of an incompleted nest, so deftly and craftily was this done. Looking directly down upon such a protected nest I was on the point of passing on, but by removing the obstruction four speckled eggs were revealed. This custom, perhaps, serves a two fold purpose; first for protection against marauders, and to shield it from the sun. On the same day I came upon a nest that I had found, on a previous trip, in the process of construction, and upon returning to it, found it apparently in the same condition as when first discovered; but remembering the trick I lifted the grass and there were four fresh eggs.

The tendency to build arched nests seems stronger in the Dusky than in Macgillivray's, and a greater number of arched nests have been found. The most beautiful nests of the Dusky are built in burned-over clumps of switch-grass where the green fresh grass has grown about a foot high. In such sites the green grass is bent over to form a canopy with the entrance over the rim of the nest. These are ex-

FIGURE 7. Nest and four eggs of the Dusky Seaside Sparrow in rushes on Merritt's Island, Brevard County, Florida.

FIGURE 8. Nest and four young of Dusky Seaside Sparrow in switch-grass on Merritt's Island, Brevard County, Florida.

tremely hard to find. I once found a nest built in a red-wing's nest, which the sparrows had arched.

All nests built in *Salicornia* or switch-grass were made of grass, deeply cupped, and lined with finer grasses. Nests found in rushes were made of dead pieces of this coarse round-stemmed grass, lined with fine grass.

The breeding season continues for about five months, beginning in April and lasting until early August. On July 13, while searching for Black Rails I discovered two nests of this sparrow each with two fresh eggs. And on July 20 a few males were heard singing.

The eggs of the Macgillivray's and Dusky Seaside Sparrows are quite similar in size and shape. Most specimens are enlongated with blunt ends, while some sets are more or less rounded. The eggs are more richly marked in the Dusky, with bolder markings of rich chestnut, and are often capped at the large end. Specimens of both species are as a rule finely sprinkled with light browns, greys, and lavender, and some sets are indistinguishable. The sets of larger numbers are in favor of the Dusky, and I believe Oscar Baynard, who found the type set, reported sets of five eggs.

The behavior of the two species around the nests is quite similar but I believe the Dusky travels farther for food, and was seen to make quite extended flights.

There is a species of ant that builds its nest in the grass, and after several heavy rains I found that it had built nests in the same grass clumps with the sparrows in three instances. The birds were compelled to desert their eggs. The nests were alive with ants, though the eggs were unharmed. Rats and Crows must play a part in the destruction of these eggs, as I found several destroyed, with broken eggshell in the nest. It is my belief that the sparrows also destroy their own eggs, for I have four or five times found nests with one or two eggs and upon returning always found them broken up.

Cape Sable Seaside Sparrow

The Cape Sable Sparrow was only recently discovered by A. H. Howell, of the U. S. Biological Survey, while working on his latest book, "The Birds of Florida." It is entirely different from any other Seaside Sparrow and is considered a full species. The type specimen was taken at Cape Sable, Munroe County, Florida, and is extremely local in distribution, with a total range of about nine miles long and a mile wide, and is found nowhere else.

H. H. Bailey, of Miami, was the first man to discover the nest of this very rare bird. His nest contained three eggs, taken in the

early part of May. No other nests had been found until 1926, when Edw. J. Court, on his trip to southern Florida, succeeded in finding a nest with eggs, which was the second in existence to my knowledge.

While on an expedition to the southern part of Florida with Wm. Leon Dawson in April, 1927, I was fortunate in finding three occupied nests, and collected a fine set of four eggs, which I have in my collection, making the third set known to science.

As nothing has ever been written about the habits of this new sparrow it might be well to relate my experience in detail.

The topography of the Cape Sable region is peculiarly different from the other parts of Florida, and many strange tropical trees abound in the big black mangrove swamps that are not found elsewhere in the State. In spots where one would expect to find wet low lands, a kind of desert vegetation abounds, such as cactus, century plants, and thorny trees and vines. Along the shore line of the Bay of Florida, is a fringe of mangrove trees, and just back of this is the peculiar vegetation spoken of above. Beyond this is a low, flat savanna covered with extensive patches of switch-grass, and, in places, acres of salt-grass, mingled with brackish shallow ponds. On the other side of the savanna are dotted clumps of black mangrove, cabbage palms, and other varieties of trees; and beyond is the heavy dense mangrove swamp. Back of the windbreak and in the savannas is where these sparrows make their home, shielded from the strong winds that sweep over the Gulf. In September, 1926, this entire region was in the throes of the most terrific hurricane Florida ever experienced, and the water washed over their haunts six and eight feet high. Where they went and how they survived through the storm that lasted three days I do not know.

The country is still about as wild as ever, and five families would cover an area of twenty miles.

Dawson, and two other members of the party with myself, arrived at the Cape on April 9, 1927. That night sleep was almost out of the question, for the sandflies and vicious, bloodthirsty mosquitoes came near killing us. Three nights were spent in such misery, until one of the natives told us to use a deserted house and build a smudge of black mangrove wood. This we did, and slept in comfort. It had not rained in four to five months, and the water supply came from rain water housed in open cisterns filled with bugs and flies. We did not care to drink this filth and were obliged to go 150 miles for twenty gallons of water. This, after we had traveled 315 miles to get to the territory.

On April 10 I started out for the sparrows not knowing exactly where to find them, and was following directions, given by my friend Howell, which are always hard to fathom in strange country. I soon sighted a scope of country that looked promising, but had to swim a canal with my clothes on to reach it. In twenty minutes I had sighted my first Cape Sable Sparrow, which rose and flew hurriedly away and lit in the grass. Soon another flushed and I could hear their weak calls among the grass. Coming to several scattered bunches of switch-grass near a shallow pond, I thought I would give it a search and in a few minutes was staring down upon my first set of four eggs of this very rare sparrow.

There was no bird in sight nor did I see one leave the nest, and there was no indication that sparrows owned this nest, so quiet and indifferent were the birds. I left the nest for fifteen minutes and returning flushed her off the nest at ten feet. She flew directly from the nest and perched on top of the grass fifteen feet away, giving a weak chirp and no other sound. Soon she disappeared seeming indifferent to the fate of her nest.

This nest was situated sixteen inches above the ground in switch-grass, about midway; and made of dead grass lined with finer blades of grass neatly cupped. Over the top of nest enough grass was placed to conceal it, though it could not be strictly called an arched nest. It gave the impression of a nest just begun. A clever stunt much used by the Dusky Sparrow. No more nests were found that day, and the number of birds seen was far less than the birds found in the colonies of Macgillivray's and Dusky Seasides.

Again on April 13, 1927, I returned with Dawson and the other two parties, determined to find more nests. I found three nests, while the others were not so fortunate and had to content themselves with examining mine. The first nest was built in the short salt-grass several inches above the ground, built of the same material, lined with fine grasses. It was only found by accidentally parting the grass and contained three young about two days old. The parents were quite solicitous, scolding with a loud chipping note, accompanied by jerks of the tail. The two preceding species also had this habit. A second nest was located by observing the parent fly into a dense clump of switch-grass three different times. Twice I searched well but could not find a nest, but the third time was rewarded by finding the nest with three young of the same age as found in the other nest. A deserted nest that had been occupied earlier in the season was found several inches above the ground in dense patch of salt-grass.

As I was alone the day I found the set of eggs and could not swim and carry my Graflex, and not daring to leave the set for fear of destruction, I did not secure any pictures.

On May 2 or 3, 1928, while searching for the eggs of the Swallow-tailed Kite, I saw and heard a male Cape Sable Sparrow in full song about forty miles north of the supposed limit of its range. The exact location was six miles northwest of a small village called Pinecrest, in Munroe County, Florida. The bird was seen among the tall bunches of switch grass, on a savanna surrounded by pine forests, possibly eight or ten miles from the Gulf. Ordinarily, water stands on this open spot, but the severe drouth in Florida for the last two years caused this area to become dry and dusty. This bird was not secured, and of course identification was not positively established, but it could hardly have been any other species and was evidently breeding. Further investigation may reveal a wider range for this species than is now known.

The nesting habits and customs are quite like the preceding species, and the eggs were like those of other Seasides. The songs seemed to me weaker, and slightly different in tone but uttered in the same characteristic fashion. Flight songs were also noted.

This sparrow nests much earlier than any other Seaside Sparrow as several fledglings were seen on the wing on April 13. These young must have come from nests built about March 15. I might say in conclusion that nests of these three species are among the most difficult to find, so well are they hidden.

The three subspecies of Seasides inhabiting the Gulf Coast I have never seen, and know nothing of their habits.

Orlando, Florida.

BIRDS OF UPPER SOUTH CAROLINA: A STUDY IN GEOGRAPHICAL DISTRIBUTION

BY A. L. PICKENS

[Concluded from the WILSON BULLETIN, September, 1928, p. 191]

CHIMNEY SWIFT. *Chaetura pelagica.* Common summer resident.

RUBY-THROATED HUMMINGBIRD. *Archilochus colubris.* Common summer resident.

KINGBIRD. *Tyrannus tyrannus.* Common summer resident.

CRESTED FLYCATCHER. *Myiarchus crinitus.* Common summer resident.

PHOEBE. *Sayornis phoebe.* Winters in Piedmont; breeds in the mountains.

WOOD PEWEE. *Myiochanes virens.* Common summer resident.

ACADIAN FLYCATCHER. *Empidonax virescens.* Common summer resident. Carolinian form ranging into the mountains, to about 2500 feet.

PRAIRIE HORNED LARK. *Otocoris alpestris praticola.* Found in winter in the lower Piedmont, at times abundant, and ranging occasionally higher in the hills.

BLUE JAY. *Cyanocitta cristata cristata.* Abundant throughout the year.

NORTHERN RAVEN. *Corvus corax principalis.* Once a yearly resident in the mountains, this species is apparently being driven back from its old nesting sites deeper into the mountains. Still occurs at times, especially in winter.

CROW. *Corvus brachyrhynchos brachyrhynchos.* Abundant throughout the year.

FISH CROW. *Corvus ossifragus.* This Carolinian bird is rare even in the lower Piedmont, probably on account of the distance from the coast and smaler rivers. Wm. Hahn, Jr., reports a single nest in the lower Piedmont in April, 1925.

STARLING. *Sturnus vulgaris.* Becoming common throughout the year about towns.

BOBOLINK. *Dolichonyx oryzivorus.* Common migrant, especially in spring.

COWBIRD. *Molothrus ater ater.* Common in lower Piedmont in winter.

YELLOW-HEADED BLACKBIRD. *Xanthocephalus xanthocephalus.* Accidental, at times in the winter, in the lower Piedmont.

RED-WINGED BLACKBIRD. *Agelaius phoeniceus phoeniceus.* Common in summer, returning in winter during warm periods, especially in lower Piedmont.

MEADOWLARK. *Sturnella magna magna.* Chiefly a winter resident, but some pairs have been found breeding both in the upper and lower Piedmont.

ORCHARD ORIOLE. *Icterus spurius.* Curiously enough, this, sometimes called an Alleghanian form, I have found breeding only in the lower Piedmont near the Austroriparian Zone. There it breeds abundantly, when further up the country one cannot be found. The wide valleys of the Broad River and the Savannah appear to invite it farther north into the upper Piedmont, locally, however.

BALTIMORE ORIOLE. *Icterus galbula.* Chiefly a migrant, but Mr. C. A. David of Greenville, found nests in his yard in several different seasons.

RUSTY BLACKBIRD. *Euphagus carolinus.* Common in winter, especially in lower Piedmont.

BREWER'S BLACKBIRD. *Euphagus cyanocephalus.* Mr. Loomis took specimens of this bird at Chester in the lower Piedmont in 1886. Forty years later Prof. Franklin Sherman and a student found specimens near Clemson College in the upper Piedmont and near the mountains. A rare winter resident apparently.

PURPLE GRACKLE. *Quiscalus quiscula quiscula.* Found in winter in the Piedmont, but Mr. Hahn has also found it breeding in Greenwood County.

BRONZED GRACKLE. *Quiscalus quiscula aeneus.* Reported from lower Piedmont in winter by Loomis. Abundant, at least, at times.

PURPLE FINCH. *Carpodacus purpureus purpureus.* Common in winter.

ENGLISH SPARROW. *Passer domesticus domesticus.* Abundant throughout the year.

CROSSBILL. *Loxia curvirostra minor.* It is somewhat strange that this bird which nests in the mountains, and winters on the coast-plain, should not be recorded, even as a migrant, in the intermediate Piedmont. Mr. N. C. Brown has reported it at Camden on the fall-line, which gives it the right to mention.

GOLDFINCH. *Astragalinus tristis tristis.* Common in the Piedmont in winter. Breeds in the mountains, making excursions into the upper Piedmont during summer.

Pine Siskin. *Spinus pinus.* Common winter resident.

Lapland Longspur. *Calcarius lapponicus lapponicus.* One record from Chester, by Mr. Loomis, January 1, 1881.

Smith's Longspur. *Calcarius pictus.* Two specimens from Chester by Mr. Loomis, one, December 1, 1880, and one February 9, 1889.

Vesper Sparrow. *Pooecetes gramineus gramineus.* Common winter resident.

Savannah Sparrow. *Passerculus sandwichensis savanna.* Common in winter in lower Piedmont.

Grasshopper Sparrow. *Ammodramus savannarum australis.* Summer in lower Piedmont, and along Broad River valley still higher.

Henslow's Sparrow. *Passerherbulus henslowi henslowi.* Migrant in lower Piedmont.

Leconte's Sparrow. *Passerherbulus lecontei.* Winters in lower Piedmont.

White-throated Sparrow. *Zonotrichia albicollis.* Common winter resident.

Chipping Sparrow. *Spizella passerina passerina.* Summer resident, but found in winter near fall-line.

Field Sparrow. *Spizella pusilla pusilla.* Common yearly resident.

Slate-colored Junco. *Junco hyemalis hyemalis.* Common in winter. The Carolina variety, *J. h. carolinensis,* appears to visit us in very cold weather.

Bachman's Sparrow. *Peucaea aestivalis bachmani.* Summer visitor in lower Piedmont. An Austral form apparently limited to the lower Piedmont.

Song Sparrow. *Melospiza melodia melodia.* Common winter resident in Piedmont; found in mountain valleys occasionally during the summer.

Swamp Sparrow. *Melospiza georgiana.* Loomis records it at Chester as a common migrant; Hahn at Greenwood as a winter resident; at Greenville I have noted it only as a spring migrant.

Fox Sparrow. *Passerella iliaca iliaca.* Winter resident, arriving late.

Towhee. *Pipilo erythrophthalmus erythrophthalmus.* Common yearly resident, and of *P. e. alleni,* a single female was found breeding near Greenwood by Mr. Hahn, 1923.

CARDINAL. *Cardinalis cardinalis cardinalis.* Common yearly resident. An Austral form ranging into the mountains, at points, quite to the summit.

ROSE-BREASTED GROSBEAK. *Hedymeles ludovicianus.* A somewhat uncommon migrant. I have found it at Greenville only in spring.

BLUE GROSBEAK. *Guiraca caerula caerula.* Common summer resident to foot of the mountains.

INDIGO BUNTING. *Passerina cyanea.* Common summer resident.

PAINTED BUNTING. *Passerina ciris.* I have noted a single female barely above the fall-line near Columbia, May 21, 1923.

DICKCISSEL. *Spiza americana.* Formerly nested in lower Piedmont, as noted in Wayne's Birds of South Carolina.

SCARLET TANAGER. *Piranga erythromelas.* Migrant in Piedmont. Breeds in mountains.

SUMMER TANAGER. *Piranga rubra rubra.* Common summer resident, even in mountains.

PURPLE MARTIN. *Progne subis subis.* Common summer resident.

BARN SWALLOW. *Hirundo erythrogastra.* Migrant in lower Piedmont.

TREE SWALLOW. *Iridoprocne bicolor.* I have encountered this species only on the coast-plain during migration, but Loomis records two specimens from Chester in the lower Piedmont.

ROUGH-WINGED SWALLOW. *Stelgidopteryx serripennis.* Common summer resident.

CEDAR WAXWING. *Bombycila cedrorum.* Found in higher Piedmont, or in the nearby mountains nearly every month in the year, but nests in this state remain to be discovered.

LOGGERHEAD SHRIKE. *Lanius ludovicianus ludovicianus.* Yearly resident, but more common in the winter. Seeking the *migrans* variety I have measured a specimen, taken near Greenville, with the characteristics of the present form even more marked than in specimens from Florida. An Austroriparian form often found near the mountains in summer.

RED-EYED VIREO. *Vireosylva olivacea.* Common summer resident.

YELLOW-THROATED VIREO. *Lanivireo flavifrons.* A common migrant; breeds at times.

BLUE-HEADED VIREO. *Lanivireo solitarius solitarius.* Occasional migrant. The Mountain Solitary variety, *L. s. alticola*, is a common

summer resident in the higher mountains. This is a Canadian and Alleghanian form.

WHITE-EYED VIREO. *Vireo griseus griseus.* Summer resident throughout Piedmont, to foot of the mountains.

BLACK AND WHITE WARBLER. *Mniotilta varia.* Common summer resident, in higher Piedmont and in mountains. Migrant in lower Piedmont.

PROTHONOTARY WARBLER. *Protonotaria citrea.* Of this Austral form that ranges so far north in the Mississippi Valley, I have but two records in upper South Carolina, neither above five hundred feet in regard to altitude.

SWAINSON'S WARBLER. *Lymnothlypis swainsoni.* Loomis found one in Chester County, and Mr. Hahn three in Greenwood, and a single nest, July 3, 1924. All these records and others are below or in the lower Piedmont, and this is an Austroriparian species.

WORM-EATING WARBLER. *Helmitheros vermivorus.* A Carolinian form that is migrant in the Piedmont but breeds in the mountains. Fairly common, from the lower valleys on up.

BLUE-WINGED WARBLER. *Vermivora pinus.* One specimen from Chester, April 30, 1887. Collected by Loomis.

GOLDEN-WINGED WARBLER. *Vermivora chrysoptera.* A rare migrant in Piedmont, and Loomis found it nesting near Caesars' Head. Visiting the identical spot as shown on the map, I failed to find any, some thirty years later. An Alleghanian form.

NASHVILLE WARBLER. *Vermivora ruficapilla.* This heretofore hypothetical species was collected near Clemson College by Mr. G. E. Hudson, April 27, 1927. (*Auk*, January, 1928).

TENNESSEE WARBLER. *Vermivora peregrina.* A common fall migrant in the Piedmont.

NORTHERN PARULA WARBLER. *Compsothlypis americana pusilla.* Intergradations of both this and the typical Parula, *C. a. americana* occur in the Piedmont during migration. Apparently the northern form is more common as a mountain breeder.

CAPE MAY WARBLER. *Dendroica tigrina.* A common spring migrant about Greenville.

YELLOW WARBLER. *Dendroica aestiva aestiva.* Common migrant; breeds in mountain valleys, and perhaps in upper Piedmont.

BLACK-THROATED BLUE WARBLER. *Dendroica caerulescens caerulescens.* Both the typical form and Cairn's variety, *D. c. cairnsi*, are found in the Piedmont as migrants, the latter may occasionally breed in our mountains. Both are Alleghanian forms.

MYRTLE WARBLER. *Dendroica coronta.* Common migrant; often seen in winter.

MAGNOLIA WARBLER. *Dendroica magnolia.* A less common migrant.

CERULEAN WARBLER. *Dendroica cerulea.* Migrant, reported only from lower Piedmont.

CHESTNUT-SIDED WARBLER. *Dendroica pensylvanica.* An Alleghanian species breeding in the mountains. Migrant in the Piedmont.

BAY-BREASTED WARBLER. *Dendroica castanea.* Spring migrant in Piedmont.

BLACK-POLL WARBLER. *Dendroica striata.* Common spring migrant.

BLACKBURNIAN WARBLER. *Dendroica fusca.* Migrant. Loomis found it common in the autumn though rare in spring. My observations are rather for spring. He took specimens in the higher mountains in June.

YELLOW-THROATED WARBLER. *Dendroica dominica dominica.* Loomis found this common in summer at Chester in the lower Piedmont. This is an Austroriparian form. The Sycamore variety, *D. d. albilora*, ranges also into the Carolinian, and this form Loomis found breeding in Pickens County near, or among, the mountains.

BLACK-THROATED GREEN WARBLER. *Dendroica virens.* An Alleghanian species that nests in the mountains. Migrant through Piedmont.

KIRTLAND'S WARBLER. *Dendroica kirtlandi.* Recorded by Loomis and also by Jenness as migrant in the eastern part of the Piedmont. No other records.

PINE WARBLER. *Dendroica vigorsi.* Common yearly resident; common in winter.

PALM WARBLER. *Dendroica palmarum palmarum.* As far east as Chester, Loomis found this and its variety, the Yellow Palm Warbler, *D. p. hypochrysea*, about equal in number in spring. I have found it very rare in any form in the higher Piedmont.

PRAIRIE WARBLER. *Dendroica discolor.* Piedmont migrant; in mountain valleys in summer. A species of the Austral zones.

OVEN-BIRD. *Seiurus aurocapillus.* Migrant in Piedmont; common mountain breeder, seeming to prefer higher altitudes though a Carolinian form.

WATER-THRUSH. *Seiurus noveboracensis.* Migratory in lower Piedmont. Most forms according to Loomis are *S. n. notabilis*, or Grinnell's Water-thrush, others being intermediate with true *S. n. noveboracensis*, which is rare.

LOUISIANA WATER-THRUSH. *Seiurus motacilla.* A Carolinian form common in the mountains in summer, and migrating through the Piedmont.

KENTUCKY WARBLER. *Oporornis formosus.* Migrant in Piedmont; breeds in mountains. A Carolinian form.

CONNECTICUT WARBLER. *Oporornis agilis.* Rare spring migrant in Piedmont, by all records from Loomis and my notes. This is interesting, as the spring route of this species is supposed to barely tip the western corner of the state.

MARYLAND YELLOW-THROAT. *Geothlypis trichas trichas.* A common summer resident. The Florida variety, *G. t. ignota*, occurs along the fall-line even in winter.

YELLOW-BREASTED CHAT. *Icteria virens virens.* Common summer resident throughout the Piedmont, and to the tops of the mountains, though an Austral form.

HOODED WARBLER. *Wilsonia citrina.* Common migrant in Piedmont, and less frequent as a summer resident; breeds well up into the mountains.

WILSON'S WARBLER. *Wilsonia pusilla pusilla.* Loomis' record of May 10, 1887, at Chester, remains the only one, for not only upper South Carolina, but the state, except for two males taken by Mr. G. E. Hudson, near Clemson in the spring of 1927. (*Auk*, January, 1928).

CANADA WARBLER. *Wilsonia canadensis.* Migrant in Piedmont; rarer in fall.

REDSTART. *Setophaga ruticilla.* A common migrant both spring and fall.

PIPIT. *Anthus rubescens.* Migrant in upper Piedmont; in winter in lower.

MOCKINGBIRD. *Mimus polyglottos polyglottos.* Common yearly resident in Piedmont.

CATBIRD. *Dumetella carolinensis.* Common summer resident.

BROWN THRASHER. *Toxostoma rufum.* Common yearly resident.

CAROLINA WREN. *Thryothorus ludovicianus ludovicianus.* Common yearly resident.

BEWICK'S WREN. *Thryomanes bewicki bewicki.* In Piedmont in winter; breeds in mountains. A Carolinian form.

HOUSE WREN. *Troglodytes aedon aedon.* Rare at all seasons; one breeding record from the lower Piedmont.

WINTER WREN. *Nannus hiemalis hiemalis.* Common winter resident.

SHORT-BILLED MARSH WREN. *Cistothorus stellaris.* Rare during migration.

LONG-BILLED MARSH. WREN. *Telmatodytes palustris palustris* Migrant at Chester.

BROWN CREEPER. *Certhia familiaris americana.* Common winter resident.

WHITE-BREASTED NUTHATCH. *Sitta carolinensis carolinensis.* Yearly resident at points in upper Piedmont and mountains. Would appear to be a winter resident only, at some points, which may indicate a dividing area between this and the Florida variety of the species which occurs nearer the coast, *S. c. atkinsi.*

RED-BREASTED NUTHATCH. *Sitta canadensis.* A rare migrant.

BROWN-HEADED NUTHATCH. *Sitta pusilla.* This Austroriparian form is a yearly resident and breeder to about 2000 feet in the Alpine regions.

TUFTED TITMOUSE. *Bacolophus bicolor.* Carolinian form; yearly resident.

CAROLINA CHICKADEE. *Penthestes carolinensis.* Throughout year; Carolinian form. This and the preceding occur to the mountain-tops and down in the Piedmont regions. Of the occurrence of the Common Chickadee, *Penthestes atricapillus,* in winter in the lower Piedmont section there is good hypothetical evidence.

GOLDEN-CROWNED KINGLET. *Regulus satrapa satrapa.* Common winter resident.

RUBY-CROWNED KINGLET. *Regulus calendula calendula.* Common winter resident.

BLUE-GRAY GNATCATCHER. *Polioptila caerula caerula.* An Austral form. Summer resident, but more common during migration, in

the Piedmont; does not nest in the mountains as a rule, it would seem, though it may penetrate mountain vales.

WOOD THRUSH. *Hylocichla mustelina.* A common summer resident.

VEERY. *Hylocichla fuscescens fuscescens.* A common migrant. An accidental Willow Thrush, *H. f. salicicola*, was taken at Chester by Loomis, October 5, 1888.

GRAY-CHEEKED THRUSH. *Hylocichla aliciae aliciae.* A common migrant. Two of Bicknell's variety, *H. a. bicknelli*, were taken at Chester, by Loomis in the migrations of the spring and fall of 1887.

OLIVE-BACKED THRUSH. *Hylocichla ustulata swainsoni.* A common migrant.

HERMIT THRUSH. *Hylocichla guttata pallasi.* Common winter resident.

ROBIN. *Planesticus migratorius migratorius.* Winter resident. The Southern and Carolinian form, *P. m. achrusterus*, nests in the upper Piedmont and mountains, and I have found it nesting at Rock Hill in York County. Here Hickory Knob, 1200 feet in altitude, and lower eminences of the Kings Mountain range, while less than alpine in height, serve to bring Carolinian and Austroriparian more sharply together along the upper Wateree than any place I have taken notice of.

BLUEBIRD. *Sialia sialis sialis.* Common yearly resident.

[The foregoing list contains 220 named forms.—Ed.]

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THE WILSON BULLETIN

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EDITORIAL

The annual meeting was held at Ann Arbor and was carried out as planned in every particular. The attendance was fully up to expectations. A full account of the meeting will be published in the March issue.

In the writer's boyhood a well-known lecturer (name forgotten) visited many parts of the country with a lecture entitled "Seeing the Elephant." Three blind men were taken to the circus to "see" the elephant. One took hold of the tail, another felt of the trunk, and the third surrounded a leg. Each one carried away a different impression of the elephant. Likewise, perhaps, different ornithologists have different impressions of the nature and importance of ornithology, according to the different phases of it with which they come in contact. So, our closet naturalists, or systematists, got hold of the tail and thought they had the whole thing; life history students surrounded the leg and took little interest in the rest; bird banders are feeling the trunk and are getting a wonderful sensation. All need to realize that the real body is greater than the parts. But many of us never get beyond the blind man stage.

A recent issue of one of the leading ornithological magazines of the world carries an advertisement of an important ornithological work now being issued. The publishers announce that "In order that this work shall not depreciate commercially, [the publishers] guarantee that, after its completion and on a date hereafter to be given, the unsold copies (if any) with the exception of a very limited number which will be retained for retail purposes, shall be destroyed."

This is probably a custom brought up from the past, and which we think hardly befits the age in which we are living. If the publishers were to profit by the destruction of the unsold copies we could understand the motive, and would consider it justifiable. But we do not see how they will gain. Only the owners of the existing books will have advantage by maintenance of the original price; and, presumably, the purchasers are mostly scientists who do not buy as an investment.

Why should not unsold remainders be held at the original price for future buyers five, ten, or more years hence? Even if sold at a reduction the publishers will be ahead more than by destroying the remainders. As the matter thus appears to us the proposal to destroy the remainders is wholly in the interest of the purchaser. This is difficult for us to understand when, as we believe, the work is purchased by scientists for its usefulness rather than as an investment. Surely science would be better served by the holding and subsequent distribution of the unsold work.

There may be a question here of the relation of the original selling price to the cost of production, which, however can only be considered with certain facts in hand. If at the completion of the work the publishers have not sold enough copies to pay for the publication, they do not add any to their income by destroying the remainders. If they have paid out on the copies sold and still have remainders which are to be destroyed, then it would seem that the subscribers take the loss. Perhaps after all we must realize that most publication, even of a scientific nature, is a commercial proposition, and is not to be judged by ideal ethical standards.

GENERAL NOTES

Conducted by M. H. Swenk

Breeding of the Florida Gallinule in Lake County, Ohio.—To my knowledge this is the first record of the Florida Gallinule breeding in this country. In late June, 1928, I discovered that a pair had remained, and judged from their actions and "talk" that they had a nest concealed somewhere along a certain point of marsh vegetation that extended into a swamp pond. Without a boat it was useless to search for the nest, but by keeping watch eventually I saw two of the young, and at the present writing (July 22) they can occasionally be seen along the edge of the water. They are in their first summer plumage.—E. A. Doolittle, *Painesville, Ohio.*

The European Starling in Calhoun County, Michigan.—Late in December, 1927, the European Starling (*Sturnus vulgaris*) was first observed near Battle Creek. There was a flock of about forty-five, and these birds spent the rest of the winter in the vicinity. They fed on scattered grain found around the barn yards.

The birds were still present this summer (1928). Two nests, the first observed in the vicinity, were found. Both were in telephone poles along the roadside. Of these two nests, the eggs were destroyed in one while a brood of four was reared in the other. Nearly every orchard immediately in this vicinity had a pair of Starlings present, probably nesting.

The birds were identified by their brownish-black color, yellow bill and their noisy character. The eggs were blue.—Lawrence Walkinshaw, *Battle Creek, Mich.*

The Pollination of Scarlet Sage Flowers by Hummingbirds.—The writer has been interested in the pollination of Salvias and other "hummingbird flowers" for quite a number of years. He does not happen to have the exact

dates that he has noted hummingbirds here at Ames, but as long ago as 1905 he observed the Ruby-throated Hummingbird (*Archilochus colubris*) upon the common Scarlet Sage, and frequently used it as an illustration of the relation of birds to the pollination of flowers. *Salvia splendens*, the Scarlet Sage now so commonly cultivated, is a native of Brazil, where it is one of the splendid "hummingbird flowers." We have quite a number of flowers pollinated by the Ruby-throated Hummingbird. One of these that I noted some years ago, in 1900, is the Jewelweed (*Impatiens fulva*). This is noted in my Ecology (p. 45).

Much has been written on the subject of pollination of the "hummingbird flowers." Dr. William Trelease (*Am. Nat.* xiv, p. 362, 1880) in several articles called attention to the pollination of such flowers as the *Passiflora incarnata. Oenothera sinuata, Lobelia cardinalis* and *Erythrina herbacea.* In another splendid article (*Am. Nat.* xv, pp. 265-269, fig. 1, 1881) he describes in detail the pollination of *Salvia splendens*, giving an excellent figure, and in another connection has mentioned the bird pollination of *Salvia gesneraefolia.* He notes the fact also in the first species that the color of the flower is most attractive to the hummingbird. Moreover, there is a reference here to the work of Fritz Mueller (*Bot. Zeit.*, p. 275, 1870) on Brazil, in which the author states that Scarlet Sages are commonly pollinated by hummingbirds. In other words, the South American hummingbirds are the important pollinators of the several *Salvias* occurring in that country.

Charles Robertson in several interesting articles has incidentally referred to the pollination of certain flowers by hummingbirds, and W. J. Beal (*Am. Nat.* xiv, p. 126, 1880) has called attention to the relationship existing between the Jewelweed and Ruby-throated Hummingbird, based on some observations made at Lansing, Michigan. My purpose in calling attention to these is the fact that I think there is a definite relationship existing between the migration of the Ruby-throated Hummingbird and the blooming of bird flowers; a matter that will be looked up later by Mr. W. M. Rosen and myself.

In a letter to me Dr. Stephens states that in 1926, on September 25 and 26, he observed the Ruby-throated Hummingbird at the *Salvia splendens* in Sioux City; that on September 25 of the same year Mr. Chas. J. Spiker saw it at the *Salvia* in another part of Sioux City; and that the same year it was observed as late as October 2 and 3 in Sioux City. Dr. Stephens further tells me that in Frank Pellett's book "Birds of the Wild" (p. 70) the hummingbird was noted at the *Salvia* as late as September 21 (year not given).

The writer was at Garner, Iowa, on October 6, 1928, and saw a beautiful patch of Scarlet Sage that was in full bloom being very appropriately used as an ornamental plant at an oil station. The owner of the station, Mr. Fred G. Hagel, told him that he had watched the hummingbirds on this all summer, and had observed sometimes as many as five or six of these birds at the same time visiting these flowers. During the last cold spell (September 26, 1928), Mr. Hagel found several hummingbirds evidently chilled. One of these died and one recovered.

Very few of the "hummingbird flowers" bloom as late as the introduced *Salvias.* I have seen the Coral Honeysuckle (*Lonicera sempervirens*) bloom as late as the month of September, but this is exceptional.—L. H. Pammel, *Ames, Iowa.*

The European Starling in Porter County, Indiana.—During the early spring months of 1927 I was greatly pleased to see a fine specimen of an European Starling (*Sturnus vulgaris*) at my farm near Wheeler, Indiana. His mate appeared a few days later. The pair nested in the cupola of a high barn. Later on, the whole family could be seen wheeling when in flight in their customary manner. All of these birds disappeared about Thanksgiving Day. This year two pairs nested in the cupola. They have now (October 2) all left the vicinity, except an adult male which can be seen every morning and evening perched on the top of a weather vane, enlivening the surroundings with his pleasing half whistling notes. I am anxious to encourage these birds, although they are fond of fruit and eat grain during the severe cold weather. They are insectivorous and frequently ride on the backs of sheep, searching for food.—Thos. D. Newton, *Wheeler, Ind.*

The European Starling at North Bristol, Trumbull County, Ohio.—A flock of eleven European Starlings (*Sturnus vulgaris*) appeared in Norton's ravine during zero weather in January, 1924, and remained about a month, feeding about the outlet of a spring. Several pairs nested the following summer in various hollow trees on the outskirts of the village of North Bristol. In every succeding summer these trees have been occupied by this species. For five successive winters Starlings have spent considerable time in and near the ravine during the severest weather, feeding and bathing at the spring outlet where I first saw them, but they never nested in any of the adjacent trees until 1928, when a pair occupied an old nesting site which had been used for years by Red-headed Woodpeckers. When the Red-headed Woodpecker arrived and found the site taken, it tried unsuccessfully to dispossess the intruders. After the Starlings had raised their brood, the red-heads again took possession of the hole. In 1927 it was the Starling which tried to dispossess the Red-headed Woodpecker. It launched no aggressive tactics, but sat in the tree hour after hour and squeaked, evidently hoping to wear out the patience of the other birds. Whenever the Red-headed Woodpecker could stand it no longer he flung himself at the Starling, but the latter bird only sailed into the air, then circled back to his perch, where he again continued his irritating squeak. After a week of this, the Starling gave up and left the vicinity. In August, 1926, appeared the first large flock of Starlings roaming around with a huge flock of Bronzed Grackles.—Marcia B. Clay, *North Bristol, Ohio.*

The Tennessee and Connecticut Warblers in Michigan.—On July 16, 1928, I found, in a small tamarack swamp at the head of an inland lake, at Huron Mountain, in northwestern Marquette County, Michigan, both the Tennessee Warbler (*Vermivora peregrina*) and the Connecticut Warbler (*Oporonis agilis*). Both were still in song, intermittently; and, while I could not be sure, I judged that more than one pair of each species were present. There was a thick undergrowth of alders, footing in the sphagnum bog was uncertain, and mosquitoes were rather bothersome. For all that, the birds responded to squeakings, and with the exercise of patience it was possible at length to get good views of both of them through the glass. The Connecticut Warbler was the more easily seen, perching more openly and moving in a more leisurely way, like a vireo; but the Tennessee Warbler, rather wary and ever active in the tangle of alder tops, was difficult. Unquestionably these were nesting birds.—Bayard H. Christy, *Sewickley, Pa.*

The Bander Is Found.—I have been able to get data as to the banding of the Marsh Hawk (*Circus hudsonius*), the capture of which was recorded in the June number of the WILSON BULLETIN (pp. 112-113) by Harold H. Bailey. According to Mr. Bailey's note the bird was shot by a friend in Brevard County, Florida, some time in November, 1927. It had a home-made aluminum band bearing the inscription "A. F. M., CoKato, Minn."

With the aid of N. E. Berg, Cokato postmaster, and the Cokato weekly newspaper, I have been able to locate the bander of the bird, Mr. Albin F. Mattson. On July 10, 1927, Mr. Mattson found a Marsh Hawk nest with five young. Four left the nest as he approached, but the fifth was much smaller than the others and it allowed Mr. Mattson to capture it. He carried it home and placed the band on it and brought it back to release it. Since this is the only bird Mr. Mattson has ever banded he has the enviable record of having received returns on 100 per cent of his banded bird(s).—GUSTAV SWANSON, *Minneapolis, Minn.*

The Snowy Owl in Tennessee.—On February 4, 1918, there appeared in one of our local papers, the following dispatch from Paris, in West Tennessee:

"White Owl Bagged. Paris, Tenn., Feb. 4.—A bird of an unusual variety has stirred up a great deal of interest in the New Boston section of Henry County. It was brought down by D. T. Emerson and it was finally decided to be a White Owl. It had beautiful plumage and was of very unusual size, measuring six feet from tip to tip."

I wrote immediately to Mr. Emerson and to the press correspondent at Paris, requesting that full particulars, and if possible the specimen itself, be sent me. On March 19th, I received by mail from Mr. Emerson a foot which I identified as that of a Snowy Owl (*Nyctea nyctea*) and a letter in which he stated that the bird had first been seen the day before he shot it, that it preferred sitting on the fence posts to the woods, and that it was perfectly white all over except for a few small black spots on the wings.

The preceding December and January had been abnormally cold months, January showing a temperature of 26.4° F. as against a normal 38.0° F., with a record breaking 10° below zero on the 12th, and also a record breaking snowfall of seventeen inches during the middle third of the month. During the week preceding February 3, the weather averaged 10° below normal, with no further snowfall.

This Snowy Owl is the only definite record for Tennessee of which I have knowledge.—A. F. GANIER, *Nashville, Tenn.*

The Sycamore Warbler in Arkansas.—Of the ten or more new records which I have been fortunate enough to secure this season, none impress me as being of as much importance as the finding of the Sycamore Warbler (*Dendroica dominica albilora*) as a resident here.

On June 24, 1928, the local boy scout troop opened their camp near Little Frog, one of the smaller mountain streams, about seven miles south of here. We had been in camp only a few hours when I started out with a group of scouts on a period of bird study instruction. We had been on this trip probably fifteen minutes when I first heard the note of these birds, and we soon found them, six in number, feeding in the tops of the sycamore trees that lined the bank of the stream. There were two adult birds and four young, just out of the nest, still being fed by the old birds. We watched them at very close range

with glasses for about thirty minutes before returning to camp. Later that day I went out with another group of boys for a longer trip, and this time we found ten birds, all but four of which were adults. We were in camp four days, and during our stay there these birds were one of the most common of the species present.

This location is in the northwest portion of the state, at an elevation of 1500 feet, and is altogether different from the Sunken Lands in eastern Arkansas, where Howell and Wheeler report the bird as a probable resident. This seems to be the first positive record of it as a summer resident in this state.—J. D. Black, *Winslow, Ark.*

A Diurnal Local Migration of the Black-capped Chickadee.—On May 20, 1928, while collecting at the tip of Sand Point (seven miles southwest of Caseville, Michigan), I witnessed a most interesting migration flight of Chickadees (*Penthestes atricapillus*). Sand Point juts out nearly four miles into Saginaw Bay from the southeast, and apparently forms an important point of departure for many species of birds migrating northward across the bay. The day was clear with but little wind. At 9:30 in the morning I noticed a compact flock of over fifty chickadees flitting rapidly through the brushy growth toward the end of the point. Their strange appearance immediately attracted my attention. They seemed very nervous and tense, with necks outstretched and feathers closely compressed against the body. They made no attempt to feed, but kept moving steadily toward the end of the point. Reaching the last tree, a twelve-foot sapling, the first birds flitted upward to the topmost twigs and there hesitated, lacking the courage to launch forth. But the rest of the flock, following close behind, in a few moments began to crowd upon them. Fairly pushed off the tree-top, the leaders finally launched forth, the rest following in rapid succession. They started upward at an angle of fully forty-five degrees. After climbing perhaps a hundred feet the leaders lost their courage, and, hesitating a moment, they all dropped precipitately back to the shelter of the bushes. But once there they immediately headed for the sapling again and repeated the performance. Finally, after several false starts, they continued out over the lake toward the Charity Islands in the distance.

It was a new experience to me to see chickadees fly by day out across miles of open water. Indeed, Brewster, in his classic paper on Bird Migration (Memoirs of the Nuttall Ornithological Club, No. 1), included the Paridae among "birds which migrate exclusively by night" and other writers seem to have accepted this statement.—J. Van Tyne, *Ann Arbor, Mich.*

Magnolia Warblers in Pelham, Massachusetts, in 1928.—The Magnolia Warbler (*Dendroica magnolia*) nesting near the house at Grey Rocks this season differed considerably in his song activities from his predecessors in 1925 (Wilson Bulletin, XXXVIII, pp. 185-199) and 1927 (*Ibid.*, XXXIX, pp. 236-237). Instead of singing a large part of the time in late June and early July he sang very little. He almost never indulged in "*wichy wichy weesy*" (I recorded it twice on July 7, once on July 18, and twice on July 23). His "*wechy weechy wee*" was slightly different from that of the 1927 Warbler, the "*wee*" being higher and more accented than the "*weechip*" was. He did not sing regularly in the evening as the others had done, nor did he frequent the west grove. In 1928 the last songs were heard August 4, six days later than in 1925 and about ten days later than in 1927.

On July 14, 15 and 21 the male was seen feeding full-grown young in juvenile plumage. On August 9 to my great surprise I discovered the female feeding two babies, with tails only three-fourths of an inch in length, just south of the house. This brood must have been hatched about July 29 or 30, the eggs laid about July 15 to 18, and the nest built about July 9 to 14.

Ten days later the young in juvenile plumage were being fed by a parent in fall plumage. They begged with a double note "*gee-gee gee-gee gee-gee*" at the rate of eight to thirteen notes in fifteen seconds. Both caught insects for themselves, but teased and fluttered with the greatest enthusiasm at the approach of the parent. One procured a green caterpillar, but in manipulating it dropped it to the ground. They were fed eight times in the hour and a half from 2:30 to 4:00 P. M. On August 20 the parent was still feeding them.

In 1925 the male *Dendroica magnolia* courted his mate while the young were in the nest, from July 7 to 15. This season a second brood must have been raised, for there was never more than one pair of birds near the house. It seems as if Black-throated Green Warblers must also have raised second broods, for two sets of parents were seen feeding young on August 7, and a third male was giving insects to a bird in juvenile plumage as late as August 23, 1928.—MARGARET M. NICE, *Columbus, Ohio.*

The Chestnut-sided Warbler Nesting Near Toledo, Ohio.—On June 20, 1928, Miss Emily Campbell and I visited an oak wood located in the eastern part of Spencer Township, Lucas County, Ohio, about eight and one-half miles west of the corporate limits of the city of Toledo. This is part of that old lake bed known as the "Oak Openings." In the middle of this wood is a small clearing, overgrown with blackberry and sumac. Here we saw a male Chestnut-sided Warbler (*Dendroica pensylvanica*) in full plumage and song.

On June 23, Mr. E. S. Thomas and Mr. Charles Walker, of Columbus, and the writer returned to the place and found the male and female both carrying food. After several false starts, due to the ingenuity of the female in making her approach, we located the nest, three feet from the ground in a clump of cornel near the base of a large oak. In the nest were four fully-fledged young. The female was very bold, and continued feeding while we stood less than six feet away. When Mr. Thomas attempted to photograph the fledglings, they left the nest with cries which brought the parent birds fluttering at our feet. But it was interesting to note that in spite of their anxiety and fear, they were not above snapping up flies or any other food which presented itself. Shortly after, Mr. Thomas secured several pictures of the female feeding one of the young. The male carried food but remained some distance away, chipping constantly. Mr. Walker collected the nest and one of the young for the Ohio State Museum.

This is probably the first nesting record of the Chestnut-sided Warbler in northwestern Ohio. Dr. Wheaton, in his "Report on the Birds of Ohio," 1879, states that it is a "summer resident in northeastern Ohio where it breeds" and mentions a nest observed by Mr. M. C. Read. Both Lynds Jones and W. L. Dawson include this species as an Ohio breeder solely on Dr. Wheaton's authority. What is probably the last account of this warbler nesting in the state appeared in "The Ohio Naturalist" of November, 1907. This nest was discovered by Miss Mary I. Hoskins on June 26, 1907, at Jefferson, Ashtabula County, Ohio, and placed under observation and reported by Robert J. Sim.—LOUIS W. CAMPBELL, *Toledo, Ohio.*

Why a New Florida Blue Jay?—The *Auk* (xlv, p. 364, July, 1928), has an article giving the description of "A New Blue Jay from South Florida," by W. E. Clyde Todd, that calls for comment.

For the past eight years, the writer has spent on the average of ten months yearly (excepting generally July and August) in Florida, most of it in lower Dade, Monroe, Brevard and West Palm Beach Counties, with the months excepted having been spent in collecting in the Piedmont and mountain sections of Georgia and North and South Carolina.

During this time, and especially previous to the going to press of "Birds of Florida," late in 1925, the writer very carefully studied the Blue Jays of Florida, and secured as well numerous skins from Georgia, with a possible view to "splitting" the local bird from those farther north.

A large series was handled, of both winter and summer birds, and birds of various ages, and after boiling it all down, the writer came to the final decision that a subspecific "split" was not warranted.

In the first place, Mr. Todd erred in selecting a winter (January 21) bird for his type, which specimen is undoubtedly a migrant; for it is a well known fact to all our year around residents that our breeding birds do not arrive in numbers until in late March or early April, and then in almost a regular migratory wave. It has always been a question where our local birds migrate to, and from whence they come in the spring.

A few Blue Jays do, however, remain in Dade County during the winter, but nothing like ten per cent of the number that breed here during the summer: and the majority of these winter birds are from farther north, generally migrating southward.

A study of the color distinction, as set forth by Mr. Todd, will not hold good, for seldom can one find any two birds alike in plumage, winter or summer; and Mr. Todd has based his supposed subspecies on color alone.

Mr. Todd uses the words "extreme southern Florida" in giving the range of this new bird. This, however, would not be Coconut Grove from whence comes his type. This would mean Monroe County. especially the keys, and possibly the Cape Sable region, where, however, Blue Jays are seldom found except as rare stragglers. If Mr. Todd means Dade County, from whence his supposed type came (Coconut Grove), he should have used breeding birds of June and July, or August (second settings), instead of a migrant of which we know not whence it came.

Much as we would like to see some bird named after Mr. John B. Semple, for he is also a personal friend of the writer, I feel certain that it should not be tacked to this supposed new subspecies, as offered by Mr. Todd, which I for one would certainly not have passed up as a "split" after all the time spent on it. Such fine points of plumage only, and which do not remain constant, varying as they do with food conditions, seasons, years, and age, must exclude it.

I must, therefore, assume that Mr. Todd, who generally is so thorough and painstaking, has in this case sacrificed his usual thoroughness. We trust he will admit his error, and so follow in the footsteps of another of our leading ornithologists, who has lately admitted in print that a subspecies he created, and which has been even universally accepted for some years, was uncalled for.—HAROLD H. BAILEY, *Miami, Fla.*

The Morning Twilight Song of the Crested Flycatcher.—From early June through July, the Wood Pewee sings a long and beautiful composition described by Dr. Wallace Craig as its "twilight song".[1] It does not seem to be generally known that the Crested Flycatcher also has a twilight song, which, though much simpler and far less musical than that of the Wood Pewee, nevertheless is a very creditable accomplishment for *Myiarchus crinitus*. My first impression of it was that it resembled somewhat a song of a hoarse Robin, although it is timed about half as fast. It consists simply of a low *wheeyer*, a pause, then a high *wheeyer*, the whole repeated over and over again.

I heard it in Oklahoma on May 25 and June 13, 1920, June 11, 1926, May 27 and June 4, 1927, and in Arkansas on June 11, 1927; on each occasion just before dawn.

On May 19, 1927, the Crested Flycatcher in the sloo woods south of Norman had not begun his song; he called from 5 A. M. on with his curious loud shouts. At my next early morning visit, May 27, the bird sang from about 5:03 to 5:07 o'clock. On June 4 the song was given from 4:55 until about 5:12 A. M. Usually high and low notes alternated, but occasionally there were two high or two low notes in succession. In one minute there were twenty-eight notes; in the next twenty-four, but during this minute there were two short rests. In the first of these minutes there were two high notes together in three cases, while in the second minute, the same was true of the low notes.

The song near Little Rock, Arkansas, on June 11, began at 4:24 A. M. and proceeded with great regularity, high and low notes alternating, until 4:32 A. M. After a few seconds' pause it began again, but now it was irregular, consisting mostly of low notes. At 4:40 A. M. the bird was still singing somewhat, almost entirely with the low notes with long intervals in between. (This was different from the Oklahoma individual, who after finishing his song gave only *wheeps* and grunts.) During one minute of the song itself there were twenty-four notes, during the last fifty seconds, twenty-one. With this bird I did not observe any exception to the regular alternation of low and high notes.

The Kingbird has a twilight song: Mrs. Olive Thorne Miller[2] tells how it was given at half past four each morning while the mate was incubating; the notes were weak and uncertain at first, but "as the days went by they grew strong and assured." "It began with a low Kingbird '*Kr-r-r*' . . . and it ended with a very sweet call of two notes, five tones apart, the lower first, . . . '*Kr-r-r-r-r-ree-be*'."

The Arkansas Kingbird may have something of the sort, for from May 28 to June 7 in the Oklahoma Panhandle, western Kansas and northeastern New Mexico, I heard an astonishing amount of clamor from this bird before dawn, but unfortunately paid little attention to it. It may be that others of the flycatchers besides these four sing "twilight songs."

I hope that some one gifted with absolute pitch will study this song of the Crested Flycatcher and give us its musical notation.—MARGARET M. NICE, *Columbus, Ohio.*

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[1] *Auk*, XLIII, pp. 150-152. (April, 1926).

[2] Little Brothers of the Air, pp. 14-15. Houghton. (1897).

ORNITHOLOGICAL LITERATURE

BIRDS OF THE EURASIAN TUNDRA. By Theodore Pleske. Memoirs Bost. Soc. Nat. Hist., Vol. 6, No. 3, Boston, 1928. Pp. 107-485. Pls. 16-38, six in color. Price, $5.00 in paper, $5.75 in cloth.

This paper by Prof. Pleske is one of the most elaborate among the faunal lists which have appeared in recent years. It is based upon the collections of the Russian Polar Expedition of 1900-1903. The history of the expedition is given in detail at the outset, and forms Part I. The ornithological work in the field was done by Dr. H. Walter, who was also the physician of the party, and by A. Bialynicki-Birula, zoologist of the St. Petersburg Academy of Science. Dr. Walter died during the second year in the field.

The tundra is defined as the alpine zone of the holarctic region. The polar region is divided into the Sylvan Zone (forests), the Subalpine Zone (brush), and the Alpine Zone (tundra), or barren lands. The Eurasian tundra described in the present work extends from the Kola Peninsula of Russia eastward over the Taimyr Peninsula to the eastern limit of Siberia. Many islands north of the mainland are included in the area of study. Seventy-one species of arctic birds are listed in Part II of the paper, which covers 231 pages. For further convenience the entire area is subdivided into twenty-one smaller portions which are treated in detail in as many sections, which form Part III, covering 76 pages. For each of the sections a list of the birds is given, and a bibliography of the literature. Part IV is a further distributional study in summary.

The plates are splendidly done by the heliotype process. There is one colored plate showing the nest and young of the Snowy Owl; another of the adult and young of the Sanderling; another of the adult and young of the Knot; another of the adult Rock Ptarmigan; all from water color paintings by B. Watagin. It is a great privilege to have such a valuable foreign work translated and published in English.—T. C. S.

THE HEATH HEN. By Alfred O. Gross, Ph. D. Memoirs Boston Soc. Nat. Hist., Vol. 6, No. 4, 1928. Pp. 487-588. Pls. 39-50. Price, $2.25 in paper, $2.90 in cloth.

Dr. Gross has been engaged for several years in a field study of the Heath Hen on Martha's Vineyard Island, Massachusetts. According to most accounts this species is on the verge of extinction, though Dr. Gross has rather an optimistic paragraph in his introduction. We have seen and heard during the past year considerable criticism of the Massachusetts authorities for their attitude toward the protection of the Heath Hen. For instance, it has been stated that more recently the authorities refused to grant a permit to the warden to kill birds of prey found in the Heath Hen refuge. It is hard to believe that such a statement would be made unless true, and still harder to believe that it is true. Without more complete information at hand we will refrain from expressing any further opinion.

Dr. Gross has had the very rare privilege of studying a species on its death-bed—perhaps for the first time in history. The inimical factors involved in the progressive decline in the Heath Hen population are enumerated by Gross as man, predaceous animals (cats, rats, hawks, owls, crows), diseases

and internal parasites, external parasites, excess males, sterility of males, and prairie fires.

The Heath Hen was first recognized as distinct from the Prairie Chicken by William Brewster in 1885, at which time it had become restricted to Martha's Vineyard Island. Its exact range prior to this time is not definitely known. The history of the species on Martha's Vineyard is one of constant decrease. In 1898 two mated pairs of Western Prairie Chickens were liberated to intermingle with the Heath Hens. About 1906 a closed season was put on the Heath Hen, and $100 fine fixed for violation. In 1907 a Heath Hen reservation was established near the center of Martha's Vineyard Island. In 1916 a prairie fire swept over the island destroying much of the cover and perhaps many of the birds.

Dr. Gross began his investigations in 1923 on the basis of a fund raised privately under the leadership of Dr. John C. Phillips. In 1925 a Heath Hen conference was held and plans were formed to continue the effort to prevent extinction. Additional money was subscribed and a warden was put to work. The report of Dr. Gross shows that the wardens did destroy some "vermin," including five owls and forty-four hawks. From 1907 to 1926 more than $60,000 has been expended in an effort to save this species from extinction. In March of 1927 it was estimated that there were less than thirty birds in existence, only thirteen being counted.

From such information as we have, from Dr. Gross' paper and other sources, we have formed the impression that the State Division of Fisheries and Game of Massachusetts has been very niggardly in its financial support of these efforts. And we do not find that the wealthy National Association of Audubon Societies has participated in the effort at all. The coming season may add an important chapter to the history of the Heath Hen. A very extensive bibliography is a valuable feature of Dr. Gross' paper.—T. C. S.

Field Book of Birds of the Panama Canal Zone. By Bertha Bement Sturgis. Published by G. P. Putnam's Sons, New York, 1928. Pp. i-xxxix+ 1-466. Pls. I-XIV (8 in color). Figs. 1-107. Price, $3.50.

This work is a carefully prepared descriptive catalogue of the birds which inhabit the Canal Zone and a few neighboring islands, including approximately 434 species. The book may probably be regarded as a popular handbook of American tropical birds. Perhaps there has been no treatise previously available to the amateur ornithologist on the bird life of the American tropics which is so clear and comprehensive.

To illustrate the richness of this region we note that twenty different hummingbirds are described; twenty-two warblers; nineteen tanagers; fifty-two flycatchers; while, on the other hand, only sixteen finches are listed.

The book belongs to the series, and has the same compact format, which began with Mathew's "Field Book of Wild Birds and Their Music." The colored plates are reproduced from paintings by Mr. F. L. Jaques. It has not been our privilege to see any other work by this artist, but we feel sure that his skill in portraying birds will receive wider recognition as it becomes better known. Several of the plates are from the excellent photographs by Dr. Willard G. Van Name.—T. C. S.

THE STATUS OF THE GREAT WHITE HERON (ARDEA OCCIDENTALIS Audubon) AND WURDEMANN'S HERON (ARDEA WURDEMANNII Baird). By Ernest G. Holt. Sci. Pub. Cleveland Mus. Nat. Hist., Vol. I, No. 1, 1928. Pp. 1-35. Pls. I-VI.

The long discussion concerning the status of *A. occidentalis*, *A. wurdemannii*, and *A. wardi* is an interesting history. The gist of the discussion is pretty well stated by the author in the opening paragraph, where he proposes three questions, viz., a) is *occidentalis* a distinct species, or only a white phase of *wardi;* b) is *wurdemannii* a colored phase of *occidentalis*, a light phase of *wardi*, or a hybrid between the two; c) must *wardi* be retired to the synonymy of *occidentalis?* After reviewing very carefully the history of the discussion, beginning in Audubon's time, and examining the evidence from animal behavior, study of eggs, plumages, and distribution, the author concludes that *A. occidentalis* is a distinct species, immaculately white, and without a colored phase; that *A. herodias wardi* possesses no white phase; and that *A. wurdemannii* is a hybrid of the other two, which is found only in the restricted area where the breeding ranges overlap. It is a scholarly paper of fascinating interest.—T. C. S.

WILD ANIMAL INTERVIEWS AND THEIR OPINIONS OF US. By William T. Hornaday. Published by Charles Scribner's Sons, New York, 1928. Pp. i-xiv+1-310. Price, $2.50.

Another volume by Dr. Hornaday! And this time he chooses the medium of humor with which to convey the lessons on animal protection. He knows about as well as anyone does what his animal friends would say if they could talk, and these fictitious interviews are not only good fiction, but are prepared in good Hornaday style. Interviews are given with thirteen species of birds, four of reptiles, and twenty-four of mammals. It makes very pleasant reading for the naturalist as well as others.—T. C. S.

AN INTRODUCTION TO THE BIRDS OF PENNSYLVANIA. By George Miksch Sutton. Published by Horace McFarland Co., Harrisburg, 1928. Pp. i-x+1-169. One colored plate, 153 text figures. Price, $1.00.

We are glad to welcome another piece of work by Dr. Sutton and another state catalogue of birds. Two hundred and twenty-nine species are described in the text proper, but a number of other less common ones are mentioned under related forms. The account of each species includes a Description of Plumages, Range in Pennsylvania, Nest and Eggs, and general remarks which usually contain some description of song or call. The book is illustrated by one colored frontispiece of the male and female Baltimore Oriole and 153 pen sketches of 197 species. The printers have not produced a good color in the male Baltimore Oriole, we think. Such a list is convenient in form, complete and up-to-date, concise and inexpensive, and will, without doubt, be of great value in assisting beginners in bird study, and will promote the science of ornithology by stimulating a wider interest and activity in the subject, and by guiding it along safe lines. Every state needs some such authentic list, and the more description which can be included, the better.—T. C. S.

OUR GREAT OUTDOORS: MAMMALS. By C. W. G. Eifrig. Published by Rand, McNally & Co., Chicago, 1928. Pp. i-xiii+1-257. Figs. 1-177; 2 col. pl. Price, $1.25.

Professor Eifrig, our fellow-member, has prepared a most excellent brief textbook on mammals, and we understand that a book on birds is to follow in the series. Typical representatives of all the important groups are discussed. And the material is so arranged that the reader is given a comprehensive survey of the mammalian group as a whole. It tends to unify the beginner's knowledge of natural history rather than scatter it. It is a book that should be added to the library of every school.—T. C. S.

THE RING-NECKED PHEASANT—ITS HISTORY AND HABITS. By Dana J. Leffingwell. Occasional Papers, No. 1, of the R. Conner Museum at the State College of Washington. April, 1928. Pp. 1-35.

This is a paper which deals with the distribution, life-history, incubation, young, calls, habits, enemies, food, and economic importance of the species in question. And it makes a valuable contribution, the collection of which must have afforded the author much pleasure.—T. C. S.

BIRDS OF THE WILD. By Frank Chapman Pellett. Published by A. T. De La Mare Co., Inc., New York. August, 1928. Pp. 1-118. Price, $1.75.

We are here presented with a new and delightful book by Mr. Pellett, in which he recounts in his usual interesting style his intimate acquaintances with birds. The greater part of the book deals with the habits and behavior of wild birds in relation to human habitations. The last chapter discusses plants that are useful in attracting birds. Many original photographs are used for the first time.—T. C. S.

AN ORNITHOLOGICAL SURVEY OF THE SERRA DO ITATIAYA, BRAZIL. By Ernest G. Holt. Bull. Amer. Mus. Nat. Hist., Vol. LVII, Art. V. Pp. 251-326. New York, 1928.

This paper is a list of 187 species of birds found by the author during a period of four and a half months on Itatiaya, the second highest mountain east of the Andes. Especial attention is given to the plant regions and life zones, which are given as three, viz., tropical, subtropical, and temperate—all being defined by altitude and forest.—T. C. S.

VARIATIONS IN THE FOX SPARROWS (PASSERELLA ILIACA) WITH REFERENCE TO NATURAL HISTORY AND OSTEOLOGY. By Jean M. Linsdale. Univ. Calif. Pub. in Zool., Vol. 30, No. 12. Pp. 251-392. Pls. 16-20. Price, $1.85.

This paper is an elaborate study of the variation in the species and subspecies of the Fox Sparrow. The variations especially considered were in the osteological system. The author did not find that enlarged bill and skull had particular survival value; but that a longer sternum seemed to have such value. Much natural history of the various races of Fox Sparrows is included in the paper.—T. C. S.

PRACTICAL COLOR SIMPLIFIED. By William J. Miskella, M. E. Published by the Finishing Research Laboratories, Inc., Chicago, 1928. Pp. i-xiv+1-114. Figs. 1-20. Col. Pls. I-VII. Price, $3.50.

The biologist and ornithologist can not be disinterested in color. The title of this book first suggested to us that it might be of some service to the biologist

in color nomenclature, or to the lantern slide colorist, or in color photography. It does not give much help directly in these fields. It is, nevertheless, a book which makes very clear many fundamental principles of color. Until we began to look over this book we did not know that the old seven-color spectrum, so necessary a part of our college physics, had become obsolete. Now, with a six-color spectrum the author of this book presents some very simple rules for color and shade combinations. Artists will probably find the color charts for complementary color mixing very unique and useful.—T. C. S.

Bird Rhymes and Field Songs. By Bert Dayton. Published by The Palisade Press, 125 Church St., New York, N. Y., 1928. Pp. 1-47. Price, 35 cents.

We are not a connoisseur of poetry and therefore hesitate to undertake a review of this pamphlet. We are quite willing, however, to accept this literary work as "rhyme." Though not indicative of the author's best lines we select the following to the Bobolink:

"Be careful in the rice fields, that you're not shot by foe"
[By edict of the United States Biological Survey]
"As over the Carolinas, you passing on will go."

We know of two or three of our W. O. C. members who give themselves up now and then to the jingle fever, and we think that all such will enjoy these verses by their fellow amateur.—T. C. S.

Natural History Notes on the Journals of Alexander Henry. By Russell Reid and Clell G. Gannon. No. Dak. Hist. Quart., Vol. 2, No. 3, April, 1928.

Alexander Henry was a trapper in the north country in the early part of the 19th century. He kept a journal and made incidental references to the mammals and birds, many of these notes being now referable to North Dakota. The authors have republished many such notes in the present paper.—T. C. S.

Notes on Birds of Lake Maxinkuckee Region. By Samuel E. Perkins III. Proc. Ind. Acad. Sci., Vol. 37, 1927. Pp. 461-466.

The author presents a list of fifty-nine species, of which nineteen are reported as additions to the Everman and Clark list of 1920.—T. C. S.

Returns Received Prior to January 1, 1927, Upon Birds Banded by Mr. Jack Miner at Kingsville, Ontario. Reprinted from the Can. Field Nat. for November and December, 1927, and January, 1928.

This report includes a great many records of banded ducks and geese taken, but many of the records are indefinite as to time, place, or species.—T .C. S.

Bird Banding in America. By Frederick C. Lincoln. Separate from the Smithsonian Report for 1927. Pp. 331-354. Pls. 1-9. Washington, 1928.

A history of banding in this country, and a statement of the results of this method, with a resume of what has been learned concerning the migration of certain species.—T. C. S.

Wild Birds Introduced or Transplanted in North America. By John C. Phillips. Tech. Bull. No. 61, U. S. Dept. Agric., Washington, April, 1928. Price, 10 cents.

This pamphlet gives a very valuable history of the intentional and accidental introduction of exotic birds into this continent, recording successes and failures. Cases of transplantation of native species are also presented. Practically every exotic species is discussed more or less fully.—T. C. S.

THE MOLTS OF THE LOGGERHEAD SHRIKE, LANIUS LUDOVICIANUS LINNAEUS. By Alden H. Miller. Univ. Calif. Publ. Zool., Vol. 30, No. 13, pp. 393-417. Berkeley California, 1928. Price, $1.85.

This paper makes a valuable contribution to the discussion of the phenomena of molt which is not easily condensed in a few lines.—T C. S .

A DISTRIBUTIONAL SUMMATION OF THE ORNITHOLOGY OF LOWER CALIFORNIA. By Joseph Grinnell. Univ. Calif. Publ. Zool., Vol. 32, No. 1, pp. 1-300. Text figures, 1-24. Berkeley, California, 1928. Price, $3.75.

The paper here listed is essentially a catalogue of the birds of Lower California, with a bibliography. The list includes 475 forms, of which 354 are full species. A check-list of all the forms is first given (pp. 33-52); then follows the annotated list, making up the bulk of the paper (pp. 53-246), including a hypothetical list of 53 forms. An extensive bibliography of 461 titles (pp. 247-286) would seem to be exhaustive, though the author modestly fears he has missed some. The usual complete index concludes the paper. Those who are interested especially in the Pacific Coast avifauna will undoubtedly find this careful work of great interest and value. Our interest is chiefly one of admiration.

We do find in the introduction a few comments of general interest wherein Dr. Grinnell expresses himself in the matter of subspecies. Since these remarks probably represent a pretty full and authoritative defense of the subspecies concept, it will be of sufficient interest to many of our readers to present them here in full.

"Much objection has been registered of late from many lay, and curiously some professional, sources against the recognition of subspecies in nomenclature, on the ground that they are difficult of discernment; and their recognition, it is urged, is therefore of no practical utility. But, I ask, is the histologist, or the embryologist, or the bacteriologist expected to confine his labors within limits easily comprehended by the laity? Why, then, should the faunal zoologist be expected to keep *his* investigations within any such bounds? Personally, as a student of vertebrate speciation I am only mildly interested in the full, Linnaean species, because the full species has passed the really significant stage in its career; I am intensely interested in the barely discernible subspecies, because *it* is in the critical formative stage, and there is a good chance that I may learn something of the causes and essential conditions of its differentiation.

"To my mind, then, in the study of subspecies as contrasted with the so-called full species we are dealing with the earliest stages in the phylogenetic process. In other words, subspecies are the fundamental elements which, in any really significant systematic and faunistic investigation, must receive primary recognition. The more accurately and acutely we can train our senses and instruments upon the detection of subspecies, the better understanding will we gain of their nature and the processes producing them." (Page 14).

On a previous page (page 2) after commenting on the "inexactness and many outright errors" often found in amateur studies, Dr. Grinnell says, "Nevertheless, it must immediately be said that without the amateur very much of the information now available in regard to Lower California would be absolutely wanting." This is just the frank concession which we would expect Dr. Grinnell to make, and which indicates that the "amateur" is entitled to consideration. We may probably assume that this is generally conceded.

Very few people are working in the fields of histology, embryology, and bacteriology other than those who are professionally engaged therein; these sciences

have very little to attract the layman. The embryologist goes right on with his investigation, and the question of whether he is a layman or professional is seldom asked; and we really do not see just why that should be a question in ornithology. If a man makes a *contribution* to ornithology is he not an ornithologist? Whether he makes his bread and butter by ornithology or in some other way does not greatly affect the status of his contribution. The importance of the contribution is determined in the crucible of science, which asks no questions as to caste, creed, color or servitude of the worker. Therefore, when an amateur, or layman, in ornithology makes a contribution to ornithology he is as good as other ornithologists in proportion to the value of his contribution. All of which, if true, should mean that an ornithologist's standing depends upon his research, scholarship, judgment, and other similar attributes. Well, this is all preliminary to the asseveration that a layman in ornithology should not be excluded from the discussion of the problem of subspecies because he *is* a layman.

Now, there are many other important biological problems besides evolution and the origin of species. The study of variation is important, but it need not occupy the whole stage. The thought of a good many is that trinomialism is confusing in its effect upon many other branches of biology, and upon the workers in other lines than taxonomy. This argument would not prevail against it, however, if trinomialism could be fully justified on other grounds. Trinomialism is a sign of taxonomic senescence. We will always need a few broad-minded taxonomists to "keep the books . . . . in order" as Chapman once put it. But surely the job is narrowing down to a point where its results are open to question. With all of the biological problems that are still unsolved why should brilliant minds be devoted to scarcely perceptible shades of color and dimensions when the gain is so doubtful and uncertain? But we will also grant that this is a personal matter unless and until such results are published to the confusion and handicap of other workers on other biological problems. Of course, evolution is going right on at its snail pace. Some hundreds of years from now present forms will have changed, undoubtedly. But we venture to assert that the written descriptions of subspecies and the trinomial terms will play very little part in discovering the evolutionary course and results. Folks then will have to rely on comparison of specimens, just as they do today.

When Dr. Grinnell affirms that in the subspecies "we are dealing with the earliest stages in the phylogenetic process" we believe that he is slightly in error. While the subspecies may be one of the stages in the origin of species there can be little doubt that the individual is the first stage. Now if we are to study phylogenesis will we not have to take into account all stages, including the species, the subspecies, the sub-subspecies, and the individual? But, is it necessary to attach names to all these stages of variation? And is there any greater reason for naming the subspecies than for naming any other recognizable intergrading form?

We are inclined to feel apologetic to Dr. Grinnell for thus discussing at length the two paragraphs in his latest work. But we see so little good in trinomialism, and we are so very skeptical of discovering the origin of species by means of the subspecies concept, and so impressed by the current abuses, that we can not let so good an opportunity for expression pass unheeded.—T. C. S.

Bird Banding Notes No. 26 from the Bureau of Biological Survey was issued on August 10. These notes are read with much interest by all who have concerned themselves with the work and results of bird banding. Our own full set of these notes will some time be bound.

COMMUNICATIONS

[EDITOR'S NOTE. The following communication originated in personal correspondence, and at the Editor's request the author consented to publication. The postscript, however, is extracted from a letter of December 4, and has been added without the expressed consent of the author because of lack of time for the exchange of letters. We trust, however, that the lack of full context will not do an injustice to the author.]

Editor, WILSON BULLETIN: In looking over the literature that has accumulated on my desk during a summer's absence in the field I find in a number of the WILSON BULLETIN a text for a few remarks which I trust may be taken in good part.

On page 86 (and following) of the June issue we find a list of stomach contents wherein partly digested fragments of birds are fully and subspecifically identified. The *species* of birds in question are undoubtedly correct, for that is within the possibilities of even fragmentary material; but that *subspecies* can be so recognized is open to doubt, to say the least. I think we may take it for granted in this case (as in many others) that the subspecific designations are made purely on geographic grounds, not from the details of the specimens themselves. It is against this common, almost universal, practice that I have, and do still, protest. It gives a pleasing appearance of scientific acumen and accuracy that is lacking in fact. If we base our distributions on determinations in faunal lists and other records, and then make those determinations from such supposed distributions we work in a vicious circle that gets nowhere and confirms what error there is without a chance of correcting it.

Determining subspecies geographically according to any particular authority involves three assumptions, viz.,

I. That no subspecies ever occurs beyond its normal range;

II. That those ranges are perfectly known to that authority;

III. That all subspecies recognized by the authority are, *ipso facto*, valid, and none others can be considered.

I do not think that any one will subscribe to these dicta, and yet without each one no geographical identification can be reliable. In some cases the logical conclusion may lead to apparent super-caution, if such a word is allowable in science. but in others the danger to be avoided is great and obvious. Where can we draw the line?

Perhaps I have been regarded by some as an awful example of radicalism along this line. The trouble is that few have taken the pains to fully understand the points involved. Perhaps I can make my principles plainer and thereby add weight to the foregoing remarks.

I am not opposed to the principle of subspecies; they are real facts, and a very valuable concept to the biologist, but:—

I. The subspecific unit is of less importance than the specific unit, and should not be treated with equality.

II. The number of subspecies possible in a varying species may theoretically be infinite, and it is only the limitation of human observation that limits the number which it is expedient to recognize.

III. In publishing a "record" we have no more right to guess at the subspecific identity than we have to guess at the specific identity.

All of which seems to me to be undeniable, though common current practice violates every one of the above principles. The only question that can be

raised regarding them is that of just the practical and useful limits of observation. Some say they are measured by the finest shades of differentiation which only the most intensively trained specialist can detect; others affirm that they are limited by the degree that can be demonstrated with reasonable certainty by any well trained student. This is just a question of degree and expediency, and is all the difference between the "splitters" and the "lumpers".

Sincerely,

P. A. TAVERNER.

National Museum of Canada,
Ottawa, Canada, October 19, 1928.

P. S. The intergradation test of specificity is unsatisfactory and subject to many criticisms, but in our present uncertainty as to what a species is I know of no more workable one. Some sort of convention or working hypothesis seems necessary, and is valuable so long as we keep in mind its provisional nature and stand ready to abandon it as soon as something better appears.

Species and subspecies are differences of degree only. Subspecific differences produced beyond a certain point become specific.

Th critical point where a subspecies becomes a species is where a biological isolation is produced; that is, where distinct isolation is produced.

The only biological isolation is genetic. Geographical isolation is the accident of circumstance and not a racial character.

An intolerance to breeding together establishes biological isolation and establishes specific identity.

By this the presence or absence of intergrades becomes a logical criterion of specific or subspecific differentiation.

P. A. T.

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200	2.00	2.75	3.50	4.25	5.50	6.75	8.00	9.25	10.50	11.75	13.00	14.25	3.00
300	2.75	3.50	4.25	5.00	6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	4.00
400	3.25	4.00	4.75	5.50	6.75	8.00	9.25	10.50	11.75	13.00	14.25	15.50	5.00
500	3.75	4.50	5.25	6.00	7.25	8.50	9.75	11.00	12.25	13.50	14.75	16.00	6.00

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DUES FOR 1929

ANNUAL DUES FOR 1929 NOW PAYABLE

This is the Treasurer's first notice to all members that dues for 1929 are now payable to the Treasurer,

Mr. J. W. Stack,
Michigan Agricultural College,
East Lansing, Michigan.

You are earnestly requested to remit at your earliest convenience, thus saving postage expense to the Club, and much time and effort to the Treasurer. A receipt will be returned only if requested.

Life Members	**$100.00**
Sustaining Members	**5.00**
Active Members	**2.50**
Associate Members	**1.50**

The Club values the continued support of every member, and every resignation is received with much regret. At the recent annual meeting at Ann Arbor a very considerable list of delinquent members was reported. Some of these members had been carried for a year or longer. The number in this delinquent list was so great that the Club considered it necessary to authorize and instruct the officers that the WILSON BULLETIN may be sent only to members not in arrears for dues. Accordingly, this action will be put into effect with the mailing of the March BULLETIN. However, those who find it inconvenient to remit by that time will be gladly allowed an extension of time if they will merely communicate with the Treasurer to such effect.

The WILSON BULLETIN again extends the season's greetings to its readers. The past year has been a reasonably prosperous one and we trust that our membership feels a degree of satisfaction with our numerical growth, at least. In spite of a considerable loss by resignation and non-payment of dues our total membership is greater than ever before. And for the first time in our history we close the fiscal year with a comfortable bank balance. We hope, however, that this showing may be merely a stimulus to greater effort.